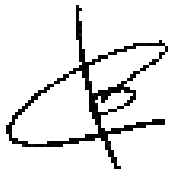
All.3.6 Dispositivi strumentali per serbatoi principali interrati.



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DATA 4 ITALY

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DC 07
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DATA 4 ITALY - DC07 Milan

Fiche technique détecteur de fuite cuve / Leak detection tank Datasheet
Scheda Rilevatore di perdite Serbatoi

Vacuum leak detector

VL ..

Documentation VL

Art. no.: 605 302
Issue: 06/2022

SGB GMBH
Hofstraße 10
57076 Siegen
GERMANY

Before commencing
any work, please read
the instructions

Overview of the design variants

The vacuum leak detectors of the VL-series are available in different designs, which are described in detail by the suffix characters. The levels of availability and the possible combinations depend on the device. Please contact our sales team: +49 271 48964-0, sgb@sgb.de

VL .. E FA P M MV S Si

“**S**ervice **i**ndication“: integrated service indicator (LED) with an adjustable service period

”**S/**Service display“: integrated service indicator (LED) with a fixed 12-month interval

”**M**agnet**v**entil/Solenoid valve“: A solenoid valve with monitored function can be connected for applications with high pressure in the inner tank.

”**M**anometer“: The leak detector is equipped with a digital pressure display in the housing cover.

”**P**rotected“: Construction of the leak detector in a weatherproof housing.

”**F**üllstands**a**nzeige**/f**illing level indication“: The leak detector is equipped with an electronic filling level indicator

„**E**nlarged functions“: With this design there is the option to connect and control additional equipment like magnetic valves and/or sensors.

„**..**“ = “Numerical value” for the alarm-vacuum of the leak detector. The alarm pressures range from 34mbar to 570 mbar.

“**V**acuum **l**eak detector“: The leak detector operates with negative pressure towards the atmosphere.

Contents of the documentation

1	Technical description		17 pages
2	Drawings to the technical description		15 pages
3	Appendix to the technical description		9 pages
	3.1	Appendix A: Use of the vacuum leak detector VL .. on interstitial spaces filled with leak detection liquid	1 page
	3.2	Appendix E: Height (diameter) and density	2 pages
	3.3	Appendix TD: Technical Data	1 page
	3.4	Appendix DP: Evaluating the display for the function "Tightness test"	1 page
	3.5	Using the leak detector on tanks which have been allowed to warm up	4 pages
	3.6	VL .. FA7: Programming the level indicator	2 pages
4	Dimension and Drilling, Plastic housing		1 page
5	Dimension and Drilling, Stainless-steel housing, weather protected		1 page
6	Working sheet „pneumatic connections“		2 pages
7	EU Declaration of Conformity		1 page
8	Declaration of performance (DoP) and manufacturer’s declaration of compliance		1 page
9	Certification TÜV Nord		2 pages
10	Warranty		1 page

Table of contents

		Page
1	Object	2
2	Field of application	2
2.1	Interstitial space requirements	2
2.2	Material to be stored	2
2.3	Resistance/materials	2
2.4	Tanks with up to 0.5 bar superimposed pressure	3
2.5	Tanks with pressures up to 5 bar (in liquid leak case)	4
2.6	Tanks with up to 10 bar superimposed pressure	4
3	Functional description	4
3.1	Normal operation	4
3.2	Air leak	4
3.3	Liquid leak	5
3.4	Switching values of the leak detector	5
3.5	Description of the display and operating elements	6
4	Mounting instructions	7
4.1	General notes	7
4.2	Mounting the leak detector	7
4.3	Mounting the (pneumatic) connection lines	8
4.4	Mounting the probe (VL .. E only)	9
4.5	Mounting the solenoid valve(s) (VL .. E only)	9
4.6	Selection of the (electrical) supply line (VL .. E only)	10
4.7	Electrical connection	10
4.8	Installation examples	10
5	Start-up	11
6	Operating instructions	12
6.1	General instructions	12
6.2	Intended use	12
6.3	Maintenance	12
6.4	Functional test	12
6.5	Alarm	15
7	Marking	16
8	Index used	16

Drawings:

Position of three-way valves	P–060 000
Installation examples (basic sketches) for tanks	A–01 to O–01
Block diagram VL ..	SL–853 600
Block diagram VL .. E	SL–854 800
Testing equipment	P–115 392

Appendices:

A	Use of the leak detector VL .. on tanks with interstitial spaces filled with leak detection liquid	A-1
E	Usage limits VL ..	E-1
TD	Technical data	TD-1
DP	Evaluating the display for the function “Tightness test”	DP-1
W	Using the VL .. leak detector on tanks which have been allowed to warm up	W-1
FA	Programming the filling level indicator FA7	FA-1

1. Object

Vacuum leak detector of the type VL .. (Dots stand for alarm vacuum) as part of a leak detection system in the following versions:

a) VL ..

b) VL .. E (Extended version, i.e., either a leak probe or solenoid valve or both can be connected in addition)

Leak probe: Either in place of the liquid stop valve if special installation conditions or resistance matters make it necessary or as a probe used separately (e.g., in the leakage containment).

Solenoid valves: **Must be used** whenever tanks are operated at **more than 5 bar** overlay pressure or if resistance requirements make them necessary (system is then executed resistant up to the solenoid valves).

2. Area of application

2.1. Interstitial space requirements

- Vacuum resistance to the operating vacuum of the leak detector, also taking fluctuations in temperature into account.
- Assurance of the suitability of the interstitial space as part of a leak detection system (e.g., DIN standards, proofs of usability issued by the building inspection authorities, determination of suitability etc.)
- No leak detection liquid in the interstitial space (see app. A if this is nevertheless the case)
- The tanks listed under sections 2.4 to 2.6 meet the above requirements acc. to App. E.
- The volume of the space monitored by the leak detector may not exceed 8 m^3 for tanks. The manufacturer recommends not to exceed 4 m^3.

2.2. Material to be stored

Liquids hazardous to water with a flash point > 60°C (for Germany > 55°C acc. to TRGS 509 and 751), where no potentially explosive vapor-air mixtures occur.

2.3. Resistance/materials

For the leak detector VL .. the material polyamide (PA) in connection with brass (MS-58) or (1.4301, 1.4306, 1.4541)[1] or 1.4571[2] as well as the material of the connecting tubes used has to be sufficiently resistant to the material to be stored/conveyed.

If the materials mentioned above are not sufficiently resistant, correspondingly resistant solenoid valves can be used in the tanks.

[1] cf. DIN 6601, centre column
[2] cf. DIN 6601, right-hand column

2.4. Tanks with up to 0.5 bar superimposed pressure

Group	Tank design	Installation example	Suitable leak detector type	Use limits
A	Single-wall, horizontal (below / above ground), cylindrical tanks or spherical tanks with leak detection lining or jacketing and suction line leading to the low point	A – 01	VL 34 to VL 570	None with respect to density and diameter
B	As A, but without suction line to the low point	B – 01	VL 230 to VL 570	Appendix E, No. E.1
C	Double-walled, horizontal, cylindrical (below / above ground) tanks or spherical tanks			
D	Double-walled (also single-wall with leak detection lining or jacketing), vertical, cylindrical tanks or troughs with a dished bottom (below / above ground) with suction line to the low point	D – 01	VL 34 to VL 570	Appendix E, No. E.3
E	As D, but without suction line to the low point	E – 01	VL 230 to VL 570	Appendix E, No. E.1
F	Rectangular or cylindrical tanks or troughs with flat bottom (completely double-walled or with leak detection lining or jacketing) with suction line to the low point	A – 01	VL 34 to VL 570	Appendix E, No. E.2
G	As F, but without suction line to the low point	B – 01	VL 230 to VL 570	Appendix E, No. E.1
H	Battery tanks in series, with suction line to the low point	H – 01	VL 30-70	Manufacturer-related Appendix E, No. E.4
I	Battery tanks parallel, without suction line to the low point, individually monitored battery tanks as G	I – 01	VL 320-420	Installation instructions acc. to I-01
J	Double-walled surface seals	J – 01	VL 230 to VL 570	Appendix E, No. E.1
K	Double-walled shafts of hydraulic cylinders (e.g. in lifts)	K – 01	VL 34 to VL 570	Appendix E, No. E.2

2.5. Tanks with pressures up to 5 bar (in liquid leak case)

Group	Type of tank	Installation example	Suitable leak detector type	Use limits
L	Vertical cylindrical tanks with double bottom (leak detection lining), leak detector connected at the bottom (e.g., GFK tanks or tanks according to DIN 4119)	L – 01	VL 255	Tank height: ≤ 25 m
M	As L, but suction and measuring pipe as joint pipe leading from the tank (with node point)	M – 01		
N	As L, but with several (parallel) pipes leading from the tank. Interstitial space divided into segments.			

2.6. Tanks with superimposed pressures up to 10 bar

Group	Type of tank	Installation example	Suitable leak detector type	Use limits
O	Versions as under 2.4, in as far as overlay pressures up to 10 bar are permissible in the respective tank.	As 2.4, but **with** solenoid valve(s): O – 01	VL 34 E to VL 570 E	See 2.4

3. Functional description

3.1. Normal operation

The vacuum leak detector is connected to the interstitial space via the suction and measuring line, possibly also via the connection line(s). The vacuum generated by the pump is measured and controlled by a pressure sensor.

When the operating vacuum (pump OFF) has been reached, the pump is switched off. Due to slight, unavoidable leaks in the leak detection system, the vacuum begins to fall slowly. When the switching value for “pump ON” has been reached, the pump is switched on and the interstitial space evacuated until the operating vacuum (pump OFF) has been reached again.

During normal operation the vacuum moves between the switching value pump OFF and the switching value pump ON, with the pump running for a short time and then switching off for a longer time, depending on the tightness and temperature fluctuations in the complete system.

3.2. Air leak

If an air leak occurs (in the outer or inner wall, above the liquid level) the vacuum pump switches on in order to re-establish the operating pressure. If the air flow leaking into the pipe exceeds the limited feed flow of the pump, the pump remains on continuously.

Increasing leak rates lead to a further increase in pressure until the switching value for alarm ON has been reached. An optical and audible alarm signal is triggered. If solenoid valves are closed, the pump stops.

3.3. Liquid leak

In the case of a liquid leak, liquid enters the interstitial space and collects at the lowest point of the interstitial space.

The incoming liquid leads to the vacuum dropping, the pump is switched on and evacuates the interstitial space(s) until operating pressure has been reached. This process is repeated until the liquid stop valve in the suction line closes.

Due to the vacuum still present in the measuring line, further leak liquid is sucked into the interstitial space, the measuring pipe and into a pressure compensating vessel if appropriate. This leads to reduction of the vacuum until the pressure has reached the “alarm ON” level. The optical and audible alarm signal is triggered. If solenoid valves are connected, they close and the pump stops.

If in place of the liquid stop valve a leak probe is mounted in the suction line in connection with solenoid valves, the alarm signal is triggered when leak liquid reaches the leak probe. This closes the solenoid valves and the pump stops.

3.4. Switching values of the leak detector in mbar

NOTE: The leak detector with the lowest alarm pressure for the respective application should be used whenever possible (lower component wear)

Type	**alarm ON**	**Pump OFF**	Use on **Group:**
VL 34, VL 34 E	> 34	< 90	A/D/F/K/O
VL 30-70	> 30	< 70	H
VL 230	> 230	< 360	A to G and J/K/O
VL 255, VL 255 E	> 255	< 380	L/M/N also poss.: A to G and J/K/O
VL 320-420	> 320	< 420	I
VL 330, VL 330 E	> 330	< 450	A to G and J/K/O
VL 410, VL 410 E	> 410	< 540	A to G and J/K/O
VL 500, VL 500 E	> 500	< 630	A to G and J/K/O
VL 570, VL 570 E	> 570	< 700	A to G and J/K/O
VL .. - .. (E)	Special switching values agreed between SGB and customer		

The measured switching value for "alarm OFF" has to be at least 5 mbar smaller than the measured switching value for "pump OFF".

The measured switching value for "pump ON" has to be at least 15 mbar bigger than the measured switching value for "alarm ON".

3.5. Description of the display and operating elements

3.5.1 States of the display elements (signal lamps)

Signal lamp	Operating state	Start-up	Start-up, alarm acknowledges	Alarm, vacuum below the "alarm ON" level	Alarm, as left-hand column, acknowledged	Alarm probe	Alarm probe, acknowledged	Alarm solenoid valve	Alarm solenoid valve, acknowledged	Device malfunction
OPERATION: green	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
ALARM: red	OFF	BLINKING	BLINKING	ON	BLINKING	OFF	OFF	ON	BLINKING	ON[3]
ALARM 2[4]: red	OFF	BLINKING	BLINKING	OFF	OFF	ON	BLINKING	ON	ON	OFF

Description:

Start-up: If the alarm is acknowledged as the pump is being put into operation, an optical distinction is not made, the audible signal is on or off depending on the button position. When the switching value "alarm OFF" has been exceeded, the audible signal is always off.

Alarm $p<p_{AE}$: Alarm signal when the vacuum in the monitored system is below the switching value "alarm ON".
NOTE: If an alarm probe should occur following this alarm signal, the alarm probe has priority! (i.e., the alarm probe is displayed. Once the cause for this has been eliminated, the Alarm $p<p_{AE}$ will be displayed again.) The audible alarm signal is not given, but the other LED blinks according to the table.

Alarm probe: See Alarm $p<p_{AE}$

Alarm solenoid valve: Is triggered when the solenoid valve has an electrical defect.

Device malfunction: Is displayed if a fault should occur on the PCB.

3.5.2 Operating functions via buttons

- Switch off audible alarm signal:
  Press the "mute" button briefly once, the audible signal is switched off, the red LED blinks. If the button is pressed again, the audible signal is switched back on.
  This function is not available during normal operation and in the event of a malfunction.
- Testing the optical and audible alarm signal
  Press the "mute" button and keep it pressed (approx. 10 seconds), the alarm signal is triggered until the button is released again. This scan is only possible if the pressure in the system has exceeded the "alarm OFF" pressure.
- Checking the tightness of the system monitored
  Press the "mute" button and keep it pressed until the signal lamp "alarm" blinks quickly after approx. 5 seconds, then release the button. The "alarm" signal lamp displays a value for tightness on the basis of the number of blinks (see chapter 6.4.5)

[3] The "mute" button is without function

[4] Only applies to VL .. E

10 seconds after this value has been displayed the signal lamp returns to normal operation. The leak detector must have carried out at least 1 automatic post-feed interval in normal operation (i.e. without external assembly pump) to achieve a valid statement.

- Zero-point adjustment
  Three-way valve 21 in position II.
  Press the "mute" button and keep it pressed until the "alarm" signal lamp blinks quickly after approx. 5 seconds, then release the button. Press the button again immediately and then release it again. Adjustment is confirmed by 3 optical and audible signals.
  Before repeating zero-point adjustment the "pump OFF" switching value must be reached.

VL .. E ONLY

- Start-up (opening the solenoid valves)
  Press the "start-up" button and keep it pressed for approx. 5 seconds until both red signal lamps light up. The solenoid valves are opened, the pump starts to run. If this button is kept pressed longer than 10 seconds, the alarm signal is generated. Shortly after the button is released the alarm signal triggered is deleted again.
  For information about activating or deactivating the solenoid valves, refer also to chapter 4.5.1

4. Mounting instructions

4.1. General notes

(1) Heed manufacturers' approval for the tanks and the interstitial space.

(2) Installation and start-up must be carried out by a qualified company[5].

(3) Heed relevant regulations concerning electrical installation[6].

(4) Heed and observe accident prevention regulations.

(5) Pneumatic connections, connection lines and fittings must be able to withstand the pressure (static pressure plus superimposed pressure) which could occur in the case of a leak, for the whole temperature range possible.

(6) Before anyone enters a dome or control shaft, the oxygen content must be checked and the shaft flushed out if necessary.

4.2. Mounting the leak detector

(1) Wall mounting, within a building

(2) To allow the ventilation slots to work properly, make sure there is a side clearance of at least 2 cm from other objects and walls.

(3) Wall mounting in the open, using a suitable protective box.
If the detector is to be mounted in a protective box, at least one of the following points must be observed:
- Signal lamps for operation must be visible from the outside (protective box with transparent lid or signal lamps mounted on the outside)

[5] For Germany: Specialist firms according to the Federal Water Act, which have verified their qualification for the installation of leak detection systems. For Europe: Authorisation from the manufacturer.
[6] For Germany: e.g., VDE regulations, regulations issued by utilities companies.

- Use of potential-free contacts to extend alarm - if these contacts are not used, additional external signal

(4) OUTSIDE potentially explosive areas.

(5) As near to the tank as possible (cf. section (6) of the following chapter).

4.3. Mounting the (pneumatic) connecting lines

(1) Plastic hoses (e.g., PVC) or tubes made of plastic or metal.
Pressure resistance, see requirements specified in chapter 4.1.

(2) Clearance at least 6 mm.

(3) Resistant to the product to be stored.

(4) Color marking: *Measuring line*: RED; *Suction line*: WHITE or TRANSPARENT, *Exhaust line*: GREEN.

(5) The full cross-section must be retained.

(6) The length of the lines between the interstitial space and the leak detector should not exceed 50 m. If the distance is bigger, a larger pipe cross-section must be used.

(7) Routing lines with lowest points: mounting of condensate traps at each lowest point (heed pressure resistance specified in 4.1).

(8) Mount the liquid stop valve in the suction line (heed pressure resistance specified in 4.1).

(9) Exhaust line must lead with slope to the tank ventilation outlet. In the case of laying with lowest points, use condensate traps.

Alternatively: The exhaust line can terminate out in the open, at a non-dangerous spot. In this case, provide for a condensate trap and liquid stop valve in the exhaust line[7].

(10) Conduits for connecting lines have to be sealed gas- and liquid tight at the inlet and outlet points.

(11) For applications using a pressure compensating vessel in the measuring line, if suction and measuring line are connected together in a node point, the following shall apply:
Per 0.1 liter volume[8] of the pressure compensating vessel, the length of the measuring line (L_{max}) may only be a maximum of

VL 230 and VL 255	17 m (6 mm clearance)	39 m (4 mm clearance)
VL 320-420	21 m	47 m
VL 330	16 m	36 m
VL 410	12 m	28 m
VL 500	10 m	22 m
VL 570	8 m	18 m

NOTE: The lower edge of the pressure compensating vessel must not be lower than the node point, the upper edge of the pressure compensating vessel must not be more than 30 cm above the node point.
Per 10 ml of the condensate trap(s) mounted in the measuring line between pressure compensating vessel and leak detector, **L_{max} is reduced by**:
0.5 m (6 mm clearance)
1 m (4 mm clearance).

[7] Condensate trap and liquid stop valve are not required if the exhaust pipe ends above a liquid-proof area (e.g., filling area, leak containment room).
[8] Multiplying this volume leads to a multiplication of L_{max}. Dividing this volume leads to a division of L_{max}.

ALTERNATIVELY: In place of the pressure compensating vessel, the measuring line can be laid from the node point over 50% of the measuring line length (=L_{min}) with approx. 1% slope to the node point.

4.4. Mounting the probe (VL .. E ONLY)

4.4.1 Probe requirements

(1) Approval as overload protection or as leak probe is required.

(2) Voltage supply identical to voltage supply of the leak detector.

(3) Current consumption of the probe P < 200 W

(4) Dry relay contacts which open in the case of alarm.

(5) Other versions can be agreed with the manufactures, since adaptation could be necessary.

4.4.2 Probe in place of the liquid stop valve

(1) A probe can be integrated in the suction line as a component part of the installation kit in place of a liquid stop valve (agree version of installation kit (MBS) with the manufacturer). The probe can also be mounted as an additional fixture at the low point of the interstitial space.

(2) With this version the leak detector indicates that liquid (product or groundwater) is in the suction line (and thus usually in the interstitial space).

(3) This version can become necessary if
– the alarm signal is not possible due to the pneumatic principle
– the liquid to be monitored is extremely dangerous (e.g., potentially fatal).
– if escaping liquid (e.g., due to "just" sufficient resistance of the interstitial space) has to be established immediately.

4.4.3 Probe in addition to the leak detector for monitoring increase in liquid level

(1) Set up or mount the probe in the space to be monitored (dome or control shaft, leak tub, leakage containment) according to the manufacturer's instructions.

(2) Install the electrical supply line to the leak detector and connect it according to the instructions in chapter 4.7.

4.5. Mounting the solenoid valve(s) (VL .. E ONLY)

(1) The solenoid valves must be mounted as near to the interstitial space as possible. Pressure resistance, resistance to substances (incl. sealing materials), temperature range and protective rating (in the case of mounting in the open air) must be guaranteed.

(2) For VL .. E: Connect two solenoid valves (one each in the suction and measuring line) to the leak detector according to the instructions in chapter 4.7:
- Voltage supply: per solenoid valve 115 V (with 230 V supply) respectively per solenoid valve 12 VDC (with 24 VDC supply)
- Current consumption: 5 to 10 W

4.5.1 Activation or deactivation of the solenoid valve monitoring

(1) If solenoid valves (or one solenoid valve) are used, solenoid valve monitoring must be **ACTIVATED**: The coding plug must be inserted according to the photo. The photo shows an active solenoid valve monitoring case.

NOTE: If solenoid valve monitoring is not activated, the valve will not open, the start-up button will not work!

4.6. Selection of the electrical supply line (VL .. E ONLY)

4.6.1 Probe

(1) Cable length should not be longer than 30 meters[9]

(2) Recommended cable type: NYM 5 x 1.5 mm^2, LiYY 5 x 0.75 mm^2 with wire-end sleeves

4.6.2 Solenoid valve(s)

(1) Cable length should not be longer than 30 meters[10]

(2) Recommended cable type: NYM 3 x 1.5 mm^2, LiYY 3 x 0.75 mm^2 with wire-end sleeves

4.7. Electrical connection

(1) Voltage supply: see type plate.

(2) Firmly laid, i.e., no plug or switch connectors.

(3) Devices with plastic housing may only be connected with a fixed cable.

(4) Terminal assignment (see also SL-853 600 (VL ..) and SL-854 800 (VL .. E):

1	230 V respectively “+” with 24 VDC voltage supply
2	230 V respectively “-“ with 24 VDC voltage supply
3/4	Occupied (leak detector pump)
5/6	External signal (voltage supply in case of alarm, is switched off using "mute" button.
7/8	VL .. E ONLY connection of the solenoid valve(s)
11/12	Dry relay contacts, open in case of alarm and power failure
21/22	VL .. E ONLY connection of the dry relay probe contacts (contacts have to be open in case of alarm and power failure)[11] NOTE: When the device is delivered a bridge is used which must be removed when the probe is connected
X/X	Serial data transmission (no. 106 in the circuit diagrams)

(5) Close unused cable glands properly and professionally.

4.8. Installation examples

Installation examples are given in the appendix.

[9] The length is limited for EMC-related reasons, longer lengths only after consultation and agreement with the manufacturer.

[10] The length is limited for EMC-related reasons, longer lengths only after consultation and agreement with the manufacturer.

[11] 9/10 ONLY for probes requiring a voltage supply. E.g., not for floating switches.

The following notes must always be heeded:

<u>Note:</u> The connection of interstitial spaces is only permitted for battery tank plants and pipework UNDER the following conditions.

1. For tanks with suction line to the low point:
   The suction line must lead either in the interstitial space or on the outside of the tank (but then pressure-resistant) from the low point of the interstitial space to above the interstitial space and also above the max. tank filling level.
2. Installation example A – 01: Here, the probe is drawn with a dotted line for the version VL .. E in order to show the different possibilities.
3. Installation example H – 01: This series connection is **ONLY** permitted and possible for the tank type(s) listed in Appendix E.4.
4. Installation example K – 01: The exhaust pipe ends in a non-dangerous position.
   The following possibilities are available for monitoring these shafts:
   – Double-walled pipe around the hydraulic cylinder, suction line in the interstitial space leading to the low point.
   – Interstitial space between the single-wall pipe and hydraulic cylinder, with the suction line leading to the low point of the interstitial space.
   – Suction and measuring line connected to the highest point of the interstitial space. In addition, probe at the low point of the interstitial space. This means the shaft can be as deep as required.

5. <u>Start-up</u>

(1) Heed and observe specifications in chapter 4.

(2) Carry out pneumatic connection.

(3) Set up electrical connection, do not apply voltage supply yet.

(4) Close the housing cover.

(5) Apply voltage supply.

(6) Establish lighting up of operating and alarm lamp as well as the audible alarm signal. Press the "mute" button, the signal lamp "alarm" will blink.

(7) <u>Only VL .. E with solenoid valve</u>: carry out the start-up sequence (see chapter 3.5.2).

(8) Three-way valve 21 in position "III", connect measuring gauge. (cf. P-060 000)

(9) Apply vacuum to the system. To do this, the installation pump can be connected to the muff on three-way valve 20, position IV. Switch on the installation pump. The interstitial space will be evacuated. Monitor the vacuum build-up on the measuring gauge.
NOTE: If no pressure is built up with the installation pump connected, the leak must be located and eliminated (if necessary, check the feed capacity of the pump and/or the position of the three-way valve).

(10) Once the leak detector has reached operating vacuum (pump in the leak detector switches off), the three-way valve must be set to position I, the installation pump switched off and removed.

(11) Three-way valve 21 in position "I", remove the measuring gauge.

(12) Carry out the functional test according to section 6.4.

6. Operating instructions

6.1. General instructions

(1) If the leak detection system is installed tightly and correctly then it can be assumed that the leak detector is working in the range of control.

(2) Frequent switching on, or continuous running of the pump indicates leaks which must be eliminated within a reasonable period of time.

(3) In the case of an alarm there is always either a major leak or a fault. The cause must be established quickly and the problem eliminated.

(4) The leak detector must be disconnected from the mains for any repair work.

(5) Use a dry cloth to clean the leak detector with a plastic housing.

(6) Current interruptions are indicated by the "operation" signal lamp going out. The alarm signal is triggered via the dry relay contacts (if used to extend the alarm).
Following the current interruption, the green signal lamp lights up again, the alarm signal is switched off via the potential-free contacts (unless the pressure has fallen below the alarm pressure during power failure). Carry out the start-up sequence for leak detectors with connected solenoid valve(s).

(7) CAUTION: The device may not be adequately protected if it is not used as specified by the manufacturer.

6.2. Intended use

- Double-walled tanks according to chapter 2, under the listed conditions
- Grounding according to valid regulations
- Leak detection system is tight according to the table in the documentation
- Leak detector is mounted outside the potentially explosive area
- Conduits into and out of dome or control shafts are closed airtight
- Electrical connection cannot be switched off

6.3. Maintenance

(1) Maintenance work and functional tests may only be carried out by trained staff[12].

(2) Work is carried out once a year to assure functional and operating safety.

(3) Extent of the tests is described in chapter 6.4.

(4) It must be checked whether the conditions described in chap. 4 to 6.3 are being observed.

(5) Disconnect from the mains before opening the leak detector housing.

6.4. Functional test

Tests of the functional and operating safety must be carried out

- after every start-up,
- acc. to chapter 6.3[13],
- after every case of troubleshooting.

[12] For Germany: qualified knowledge or under the responsibility of a qualified person.
For Europe: Authorisation from the manufacturer.

[13] For Germany: heed state-specific regulations accordingly (e.g., AwSV)

6.4.1 Extent of the test

(1) If necessary, discuss the tasks to be carried out with the person responsible on-site.

(2) Heed the safety instructions regarding contact with the stored products present.

(3) Monitoring and emptying the condensate traps if necessary (6.4.2).

(4) Testing the probe if appropriate (chapter 6.4.3)

(5) Check the free passage of air in the interstitial space (chapter 6.4.4).

(6) Test the switching values with the interstitial space (chapter 6.4.5).
Alternatively: test the switching values using the test device (chapter 6.4.6).

(7) Test the lift of the vacuum pump (chapter 6.4.7).

(8) Check tightness of the leak detection system (chapter 6.4.8).

(9) Set up operating state (chapter 6.4.9).

(10) A qualified person must fill out a test report confirming function and operational safety.

6.4.2 Checking and emptying the condensate traps if necessary

(1) If there are shut-off valves on the interstitial space, close these.

(2) Three-way valve 20 and 21 to position IV to ensure aeration of the connecting lines.

(3) Open condensate traps and empty them. NOTE: Condensate traps can contain storage product(s), make sure you take suitable precautions.

(4) Close condensate traps.

(5) Three-way valves 20 and 21 to position I.

(6) Open shut-off valves on the interstitial space.

6.4.3 Testing the probe

(1) If there are shut-off valves on the interstitial space, close these.
(Not applicable when the probe is installed separately from the leak detector. Also applicable for section (2) and section (6))

(2) Three-way valve 20 in position IV, thus aeration of the connecting line.

(3) Remove probe and check reaction in storage products or water.

(4) Establish optical and audible alarm signal on the leak detector. Press the "mute" button if necessary.

(5) Clean/dry and insert the probe.

(6) Move three-way valve 20 to position I and open the shut-off valves.

6.4.4 Checking the free passage of air in the interstitial space

(1) Connect the measuring gauge to three-way valve 21, then position III.

(2) Three-way valve 20 to position IV, thus aeration of the interstitial space.

(3) Determine the drop in pressure on the measuring gauge. If there is no drop in pressure, establish the cause and eliminate it.

(4) Three-way valve 20 and 21 to position I.

(5) Remove measuring gauge.

6.4.5 Testing the switching values using the interstitial space

(1) Connect the measuring gauge to three-way valve 21 and three-way valve 21 in position III.

(2) Three-way valve 20 to position IV, thus aeration of the interstitial space.

(3) Determine switching values "pump ON" and "alarm ON" (with optical and audible alarm signal). Note values.

(4) Press the "mute" button if necessary.

(5) Three-way valve 20 to position I (if necessary, carry out the start-up sequence (see chapter 3.5.2)) and determine switching values "alarm OFF" and "pump OFF". Note values.

(6) The test is considered passed if the switching values measured are within the specified values.

(7) Three-way valve 21 to position I. If necessary, press "mute" button again.

(8) Remove the measuring gauge.

6.4.6 Testing the switching values using the testing device (P-115 392)

(1) Connect the testing device with both hose-ends on one of the free muffs of three-way valves 20 and 21 respectively.

(2) Connect the measuring gauge to the T-piece of the testing device.

(3) Close the needle valve of the testing device.

(4) Three-way valves 20 and 21 to position II. Operating pressure is built up in the test tank.

(5) Aerate using the needle valve, determine the "pump ON" and "alarm ON" (optical and audible) switching values. Note values.

(6) Press the "mute" button if necessary.

(7) Carry out the start-up sequence if necessary.

(8) Slowly close the needle valve and determine the switching values "alarm OFF" and "pump OFF".

(9) The test is considered passed if the switching values measured are within the specified values.

(10) Three-way valves 20 and 21 to position I. Press the "mute" button if appropriate.

(11) Remove the testing device.

6.4.7 Testing the lift of the vacuum pump

(1) Connect a measuring gauge to three-way valve 20. Three-way valve 20 to position II.

(2) Three-way valve 21 to position II, thus aeration of the pressure switch, the alarm is triggered, the pump runs (carry out the start-up sequence, if necessary, to make the pump run)

(3) Read off the lift of the pump on the measuring gauge.

(4) The test is considered passed when the pressure value reached is
> 150 mbar (Type 34 and 30-70),
> 430 mbar (Type 230, 255)
> 500 mbar (Type 330, 230-340),
> 600 mbar (Type 410)
> 680 mbar (Type 500) or
> 750 mbar (Type 570).

(5) Three-way valve 20 and 21 to position I.

(6) Remove the measuring gauge.

6.4.8 Tightness test on the leak detection system

(1) Check that all the shut-off valves between the leak detector and interstitial space are open.

(2) Connect the measuring gauge to three-way valve 21, position III.

(3) For the tightness test, the vacuum pump must have reached the "pump OFF" switching value. Wait for possible pressure compensation and then begin with the tightness test.

(4) It must be evaluated as positive if the values in the following table are observed. A higher drop in pressure means increased stress on the wear parts.

Volume of interstitial space in liters	1 mbar drop in pressure in
100	9 minutes
250	22 minutes
500	45 minutes
1000	1.50 hours
1500	2.25 hours
2000	3.00 hours
2500	3.75 hours
3000	4.50 hours
3500	5.25 hours
4000	6.00 hours

(5) Test valve to position I, remove measuring gauge.

6.4.9 Setting up the operating condition

(1) Seal the housing.

(2) Seal the shut-off valves (between leak detector and interstitial space) in the open position for every interstitial space connected.

6.5. Alarm

(1) In case of alarm the "alarm" signal lamp lights up and the audible signal sounds.

(2) If available, close the shut-off valves in the connection line between interstitial space and leak detector.

(3) Switch off the audible signal by pressing the "mute" button. The button will light up.

(4) Determine the cause of the alarm signal according to the table in chapter 3.5.1.

(5) Inform the installation company (detailing the cause of the problem if possible).

(6) The installation company has to determine and eliminate the cause.

(7) Carry out the functional test according to chapter 6.4, observing the conditions specified in chapters 4 to 6.2.

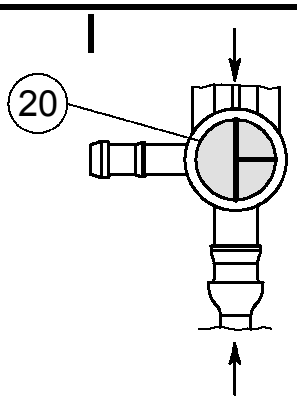
7. Marking

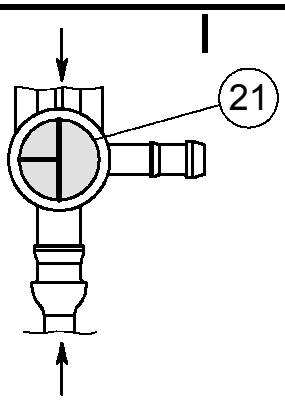
- Type
- Electrical data
- Manufacturer or manufacturer's mark
- Model year (month/year)
- Serial number
- Statutory marks

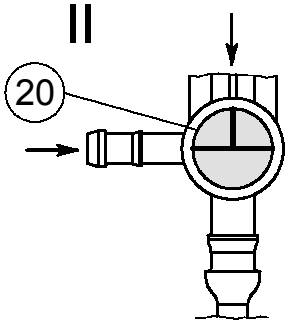
8. Index used

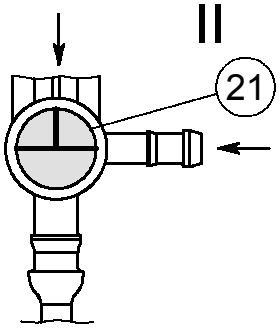
01	Signal lamp "alarm", red	
01.2	Signal lamp "alarm 2", red (leak probe)	
02	Shut-off valve	
03	Exhaust line	
09	Signal lamp "operation", green	
20	Three-way valve in the suction line	
21	Three-way valve in the measuring pipe	
22	Needle valve	
24.1	Fine-wire fuse	T 1 A (230 V version)
		T 1 A (24 VDC version)
24.2	Fine-wire fuse	T 250 mA (230 V version)
		T 1 A (24 VDC version)
24.3	Fine-wire fuse	T 1 A (230 V version)
		T 1 A (24 VDC version)
27	Liquid stop valve	
27*	Liquid stop valve, connection against the block direction	
30	Device housing	
33	Condensate trap	
36	"Start-up" button	
43	Measuring pipe	
44	Solenoid valve	
52	Measuring gauge	
57	Test valve	
59	Relay	
60	Vacuum pump	
61	Check valve with filter	
68	Suction line	
69	Buzzer	
71	"Mute" button	
73	Interstitial space	
74	Connection line	
76	Main PCB	
84	Test tank 1 liter	
85	Test muff for measuring gauge	
88	Double-walled pipe	
89	Double-walled battery tank	
93	Tank ventilation	
95	Pressure compensating vessel	

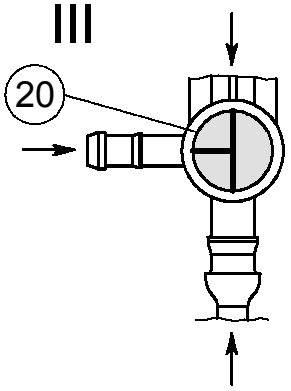
96 Node point
97 Leak probe (only VL .. E)
98 Sealing plug
101 Suction line leading to low point
102 Pressure sensor
105 Control unit
106 Contacts for serial data transmission
111 Cooling section
112 Insulation

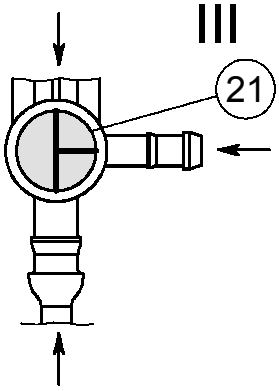


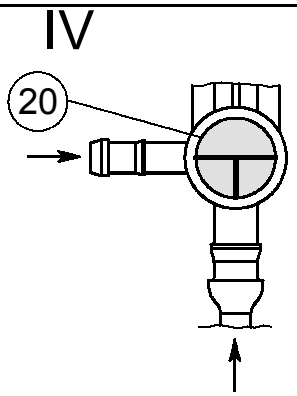


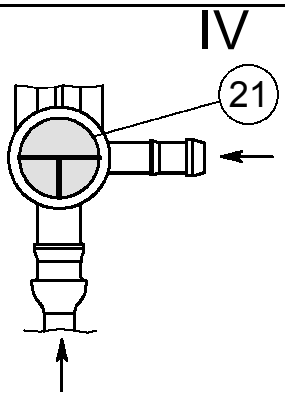












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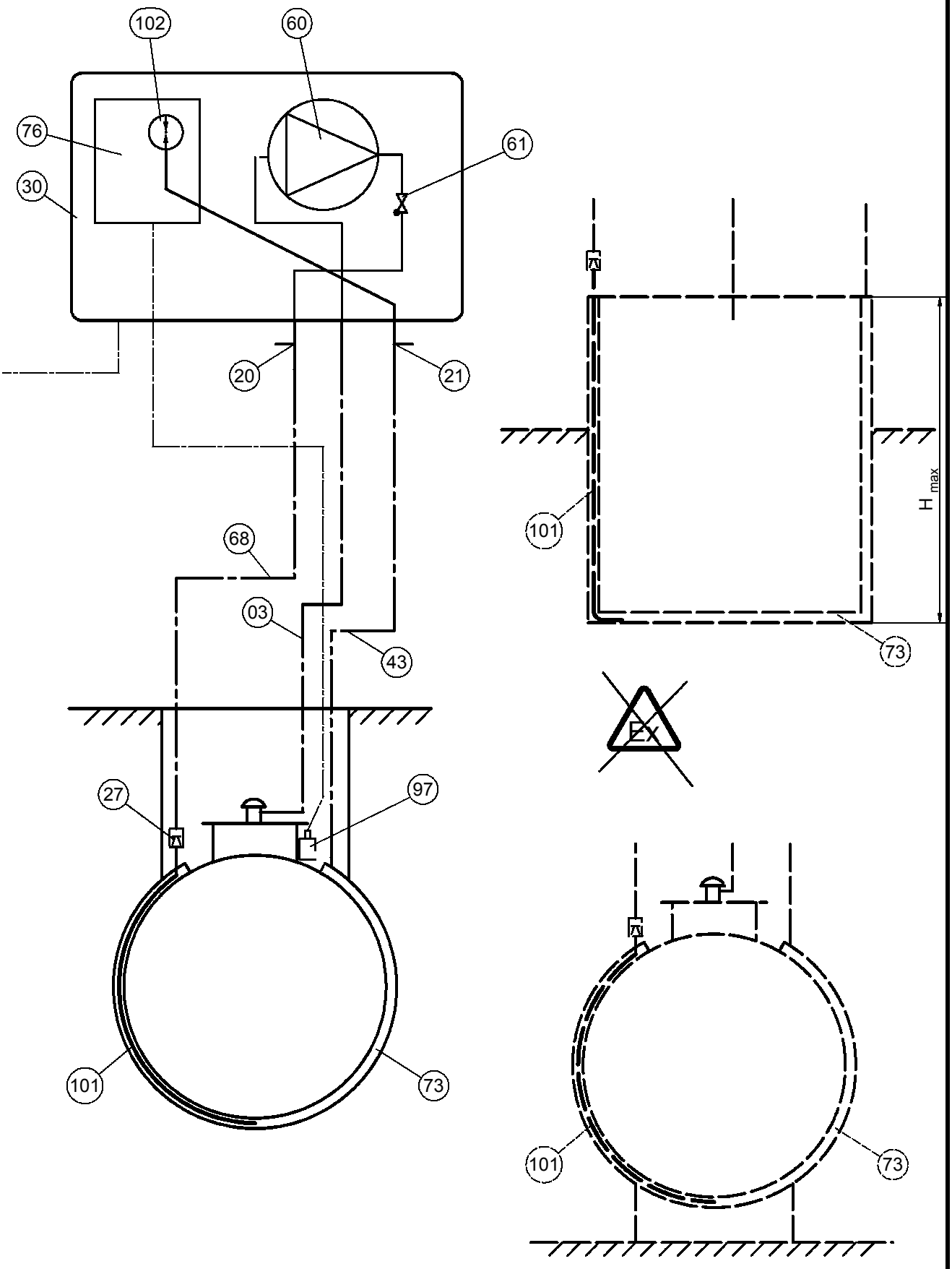

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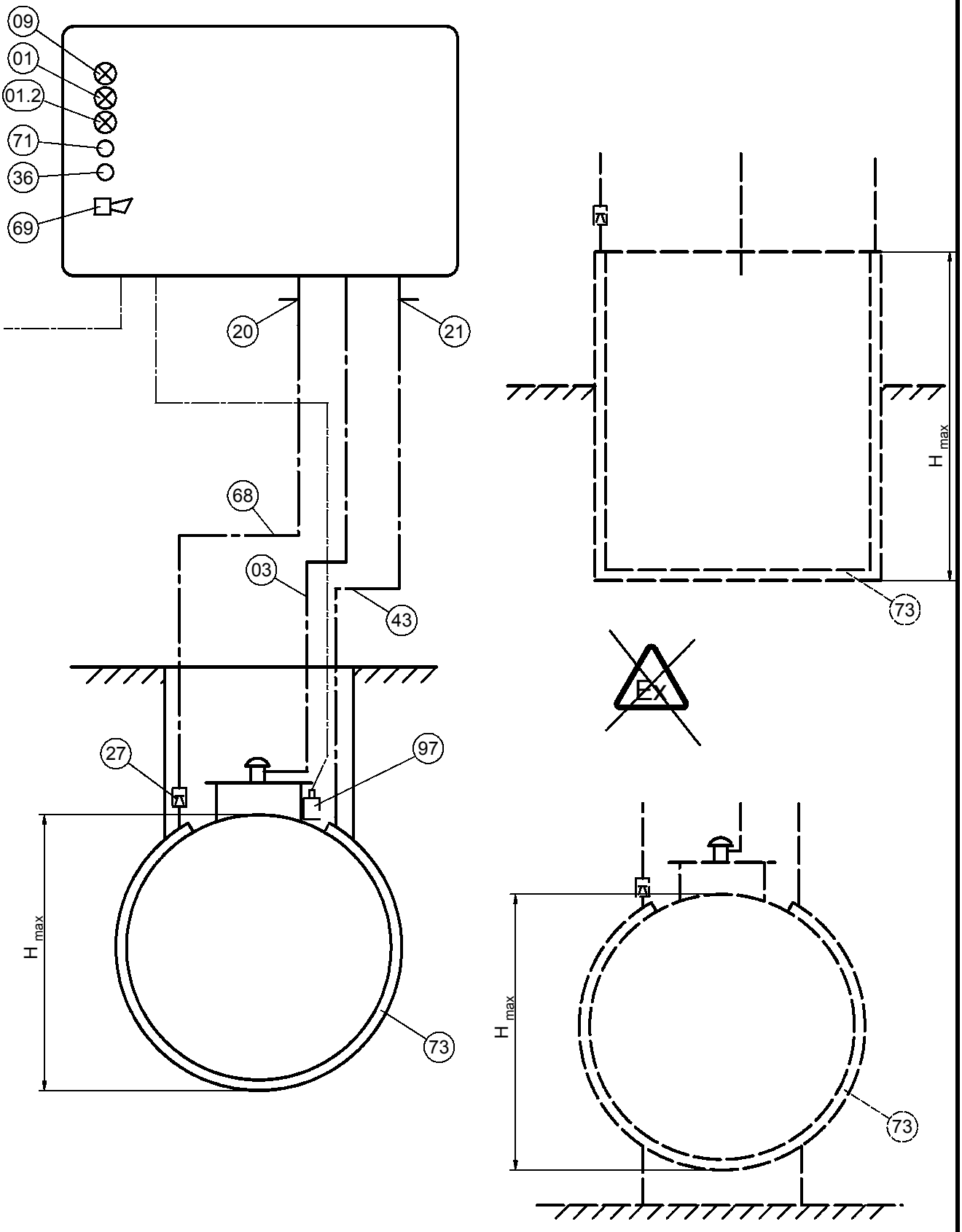

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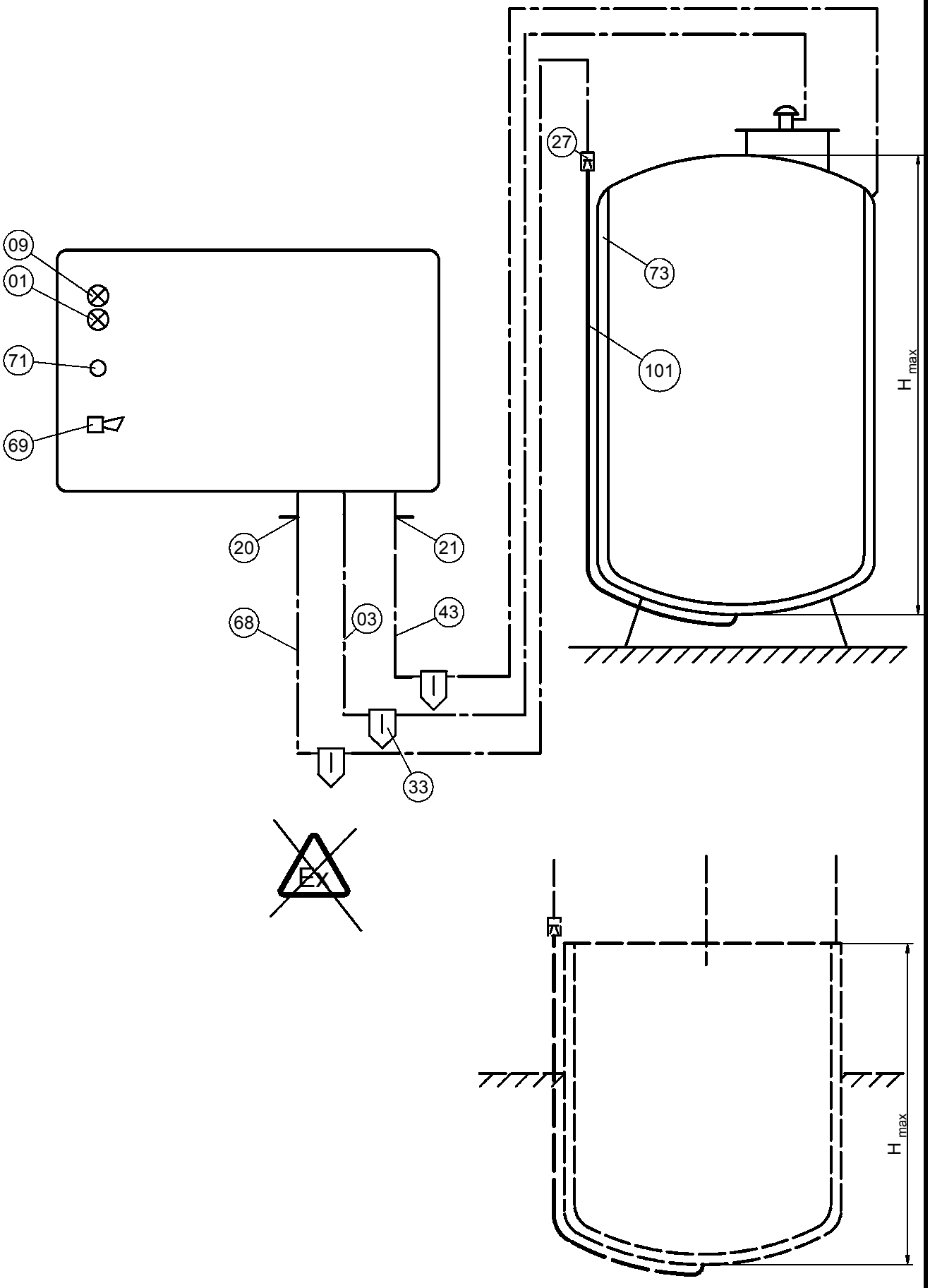

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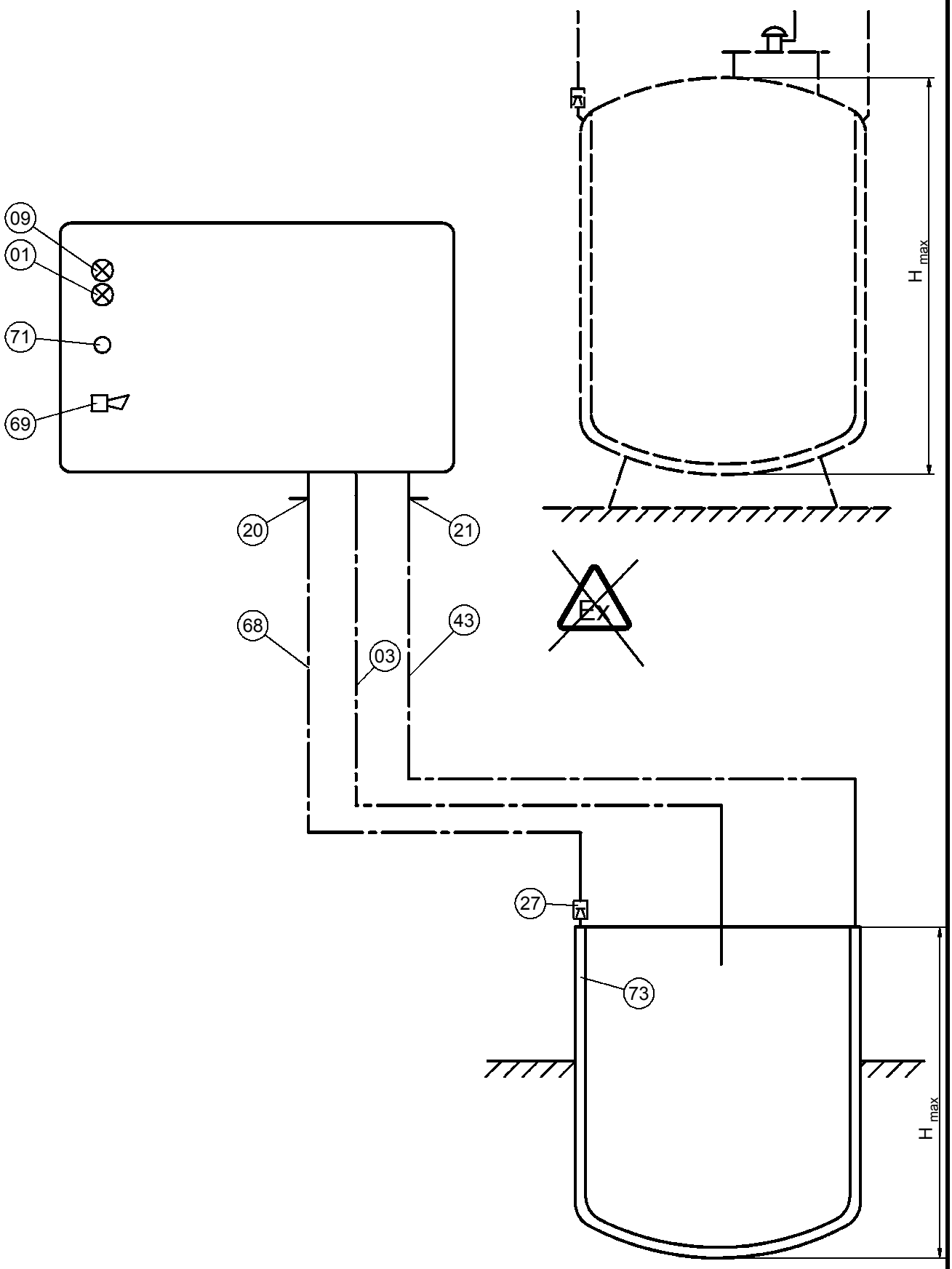

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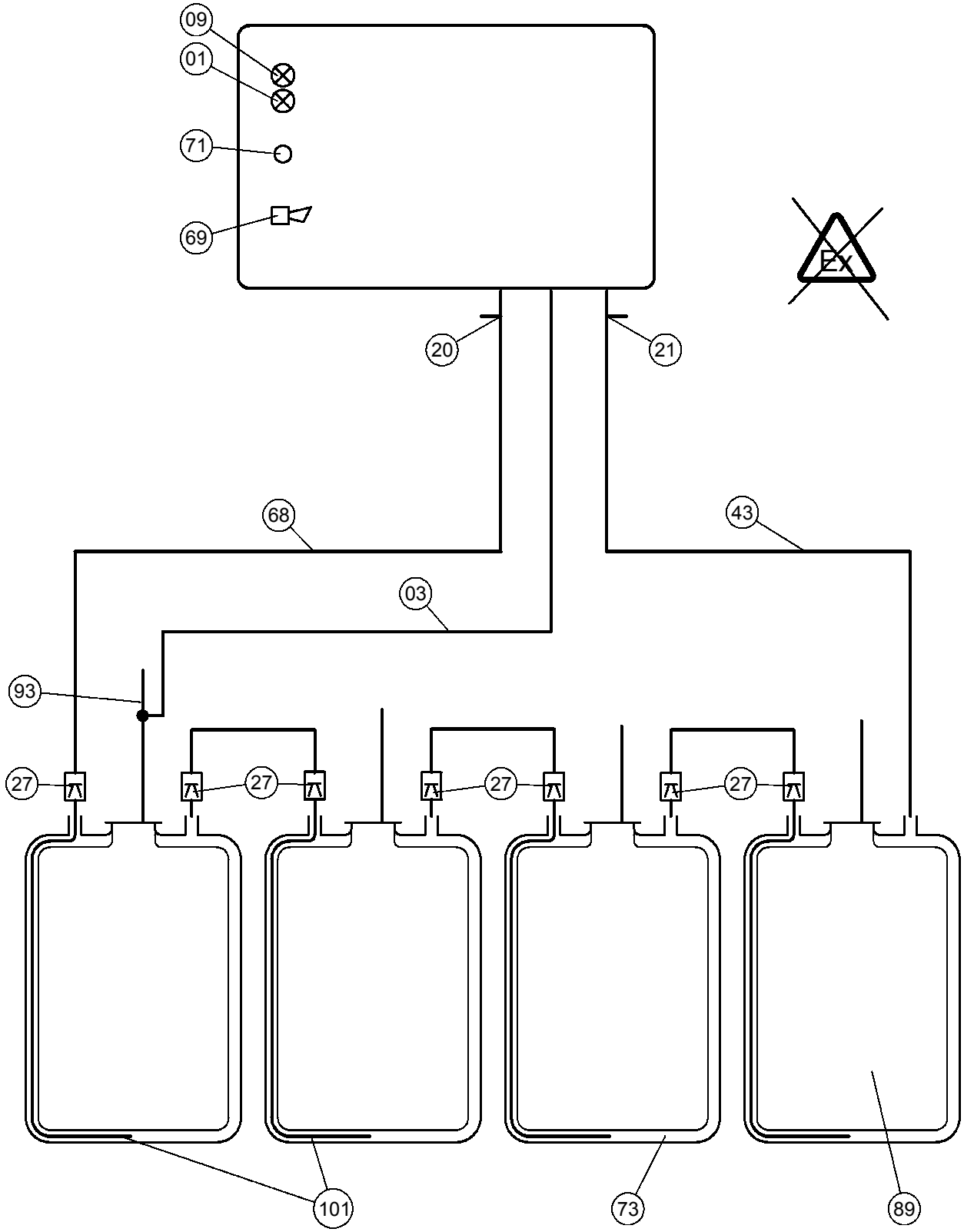

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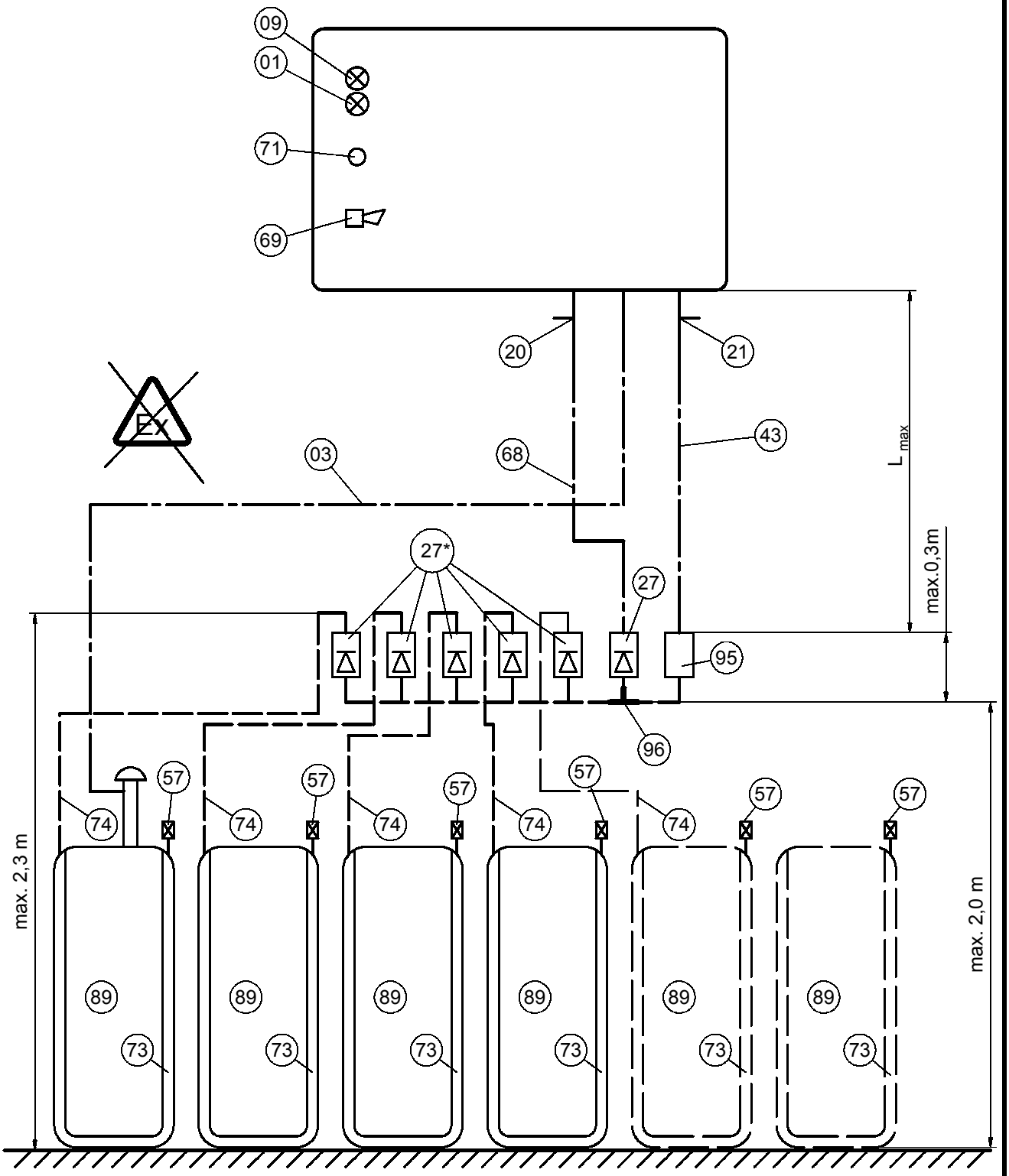

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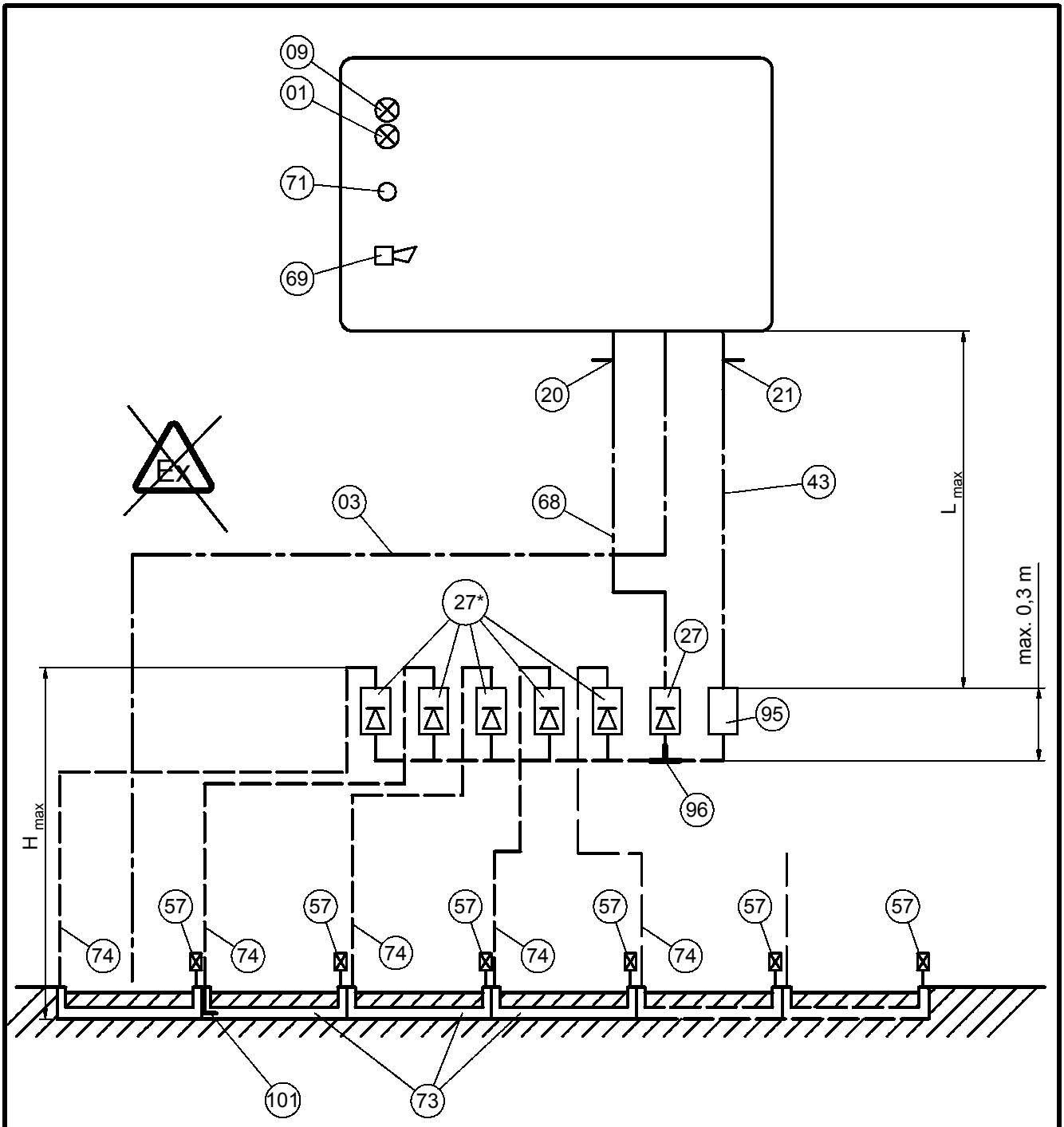

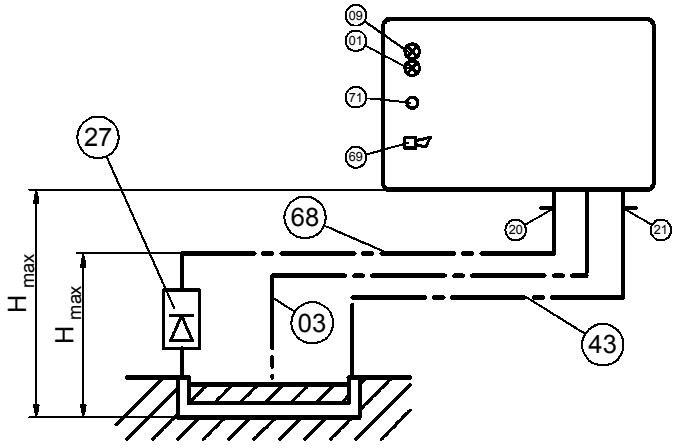

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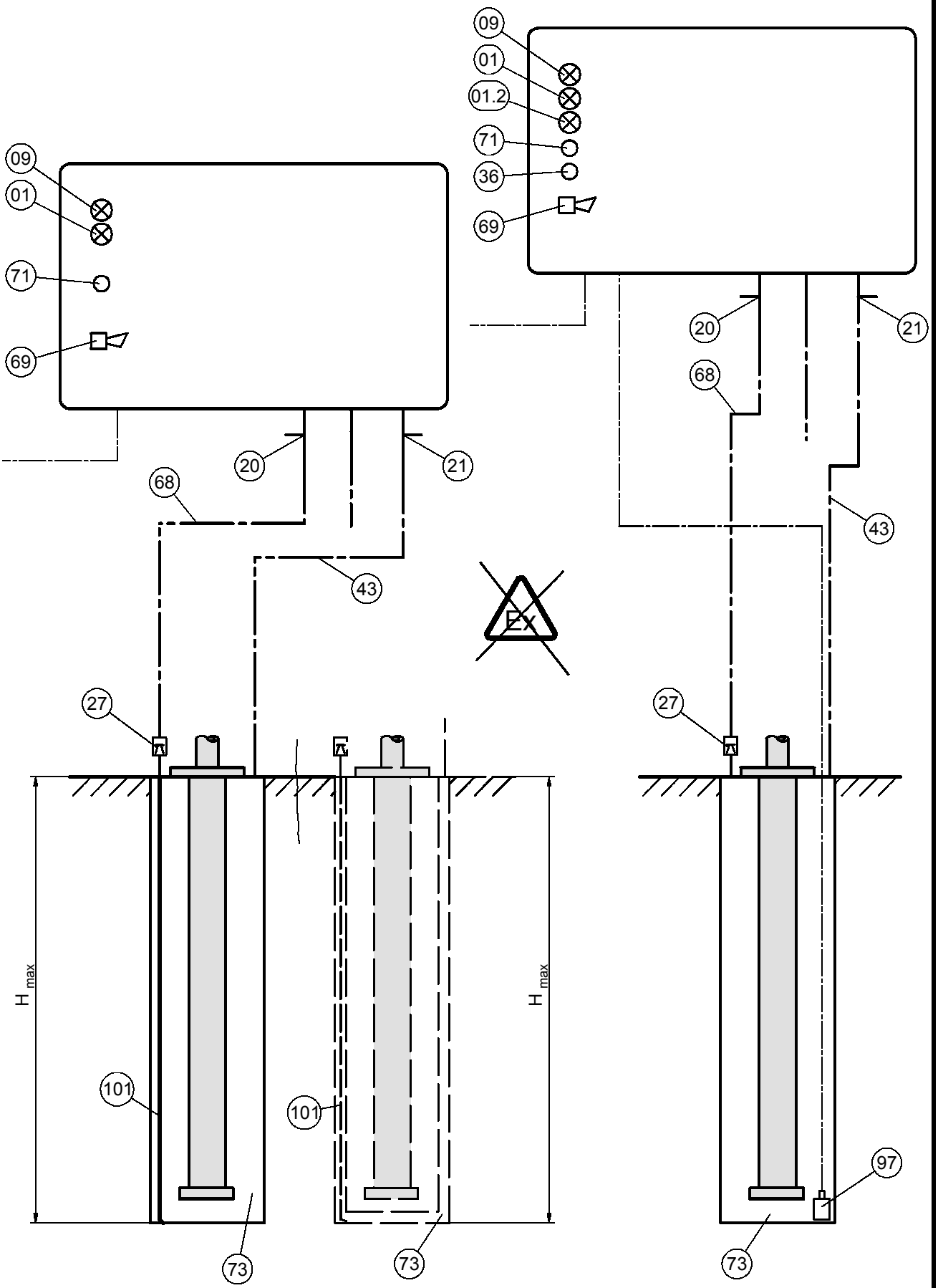

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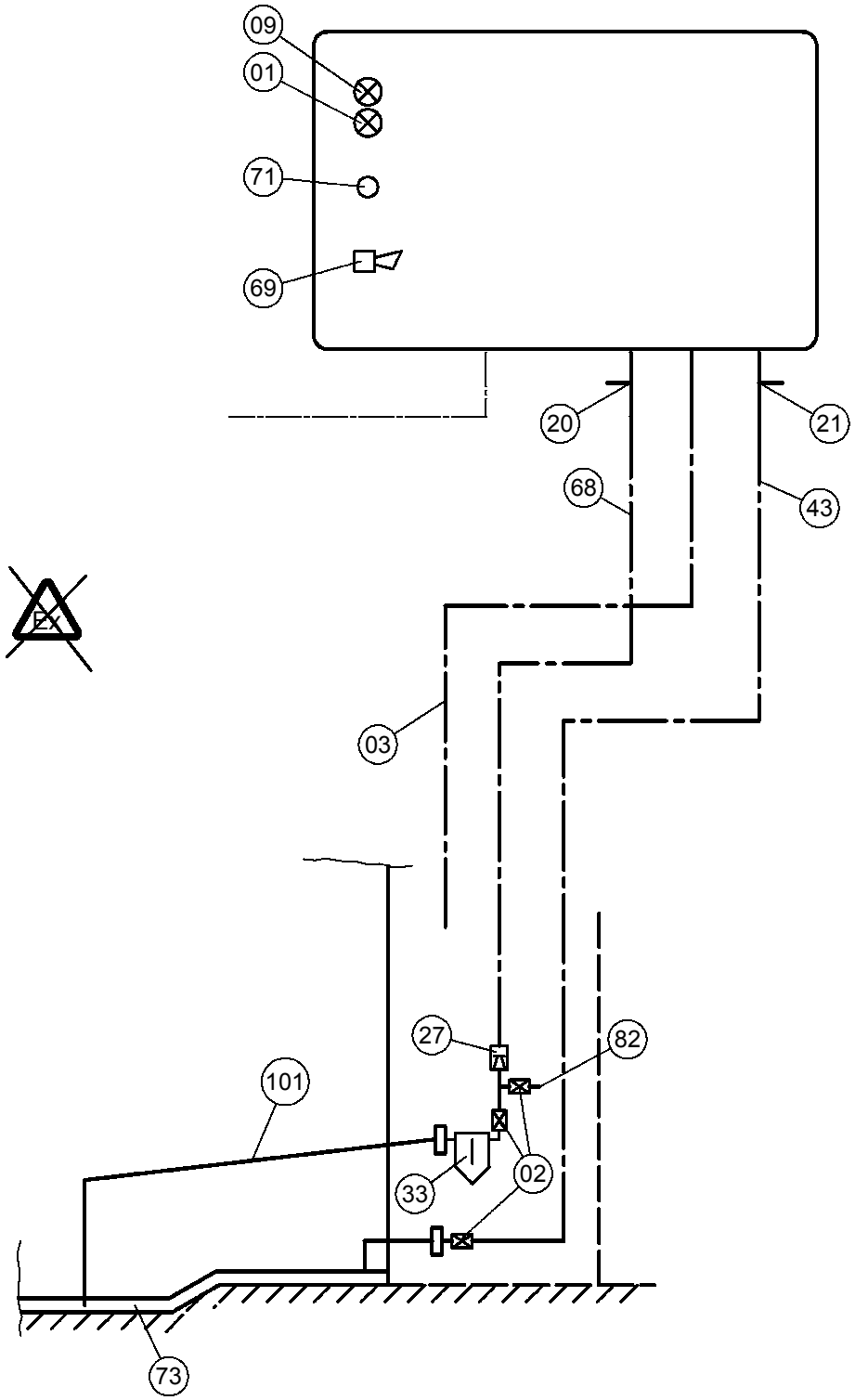

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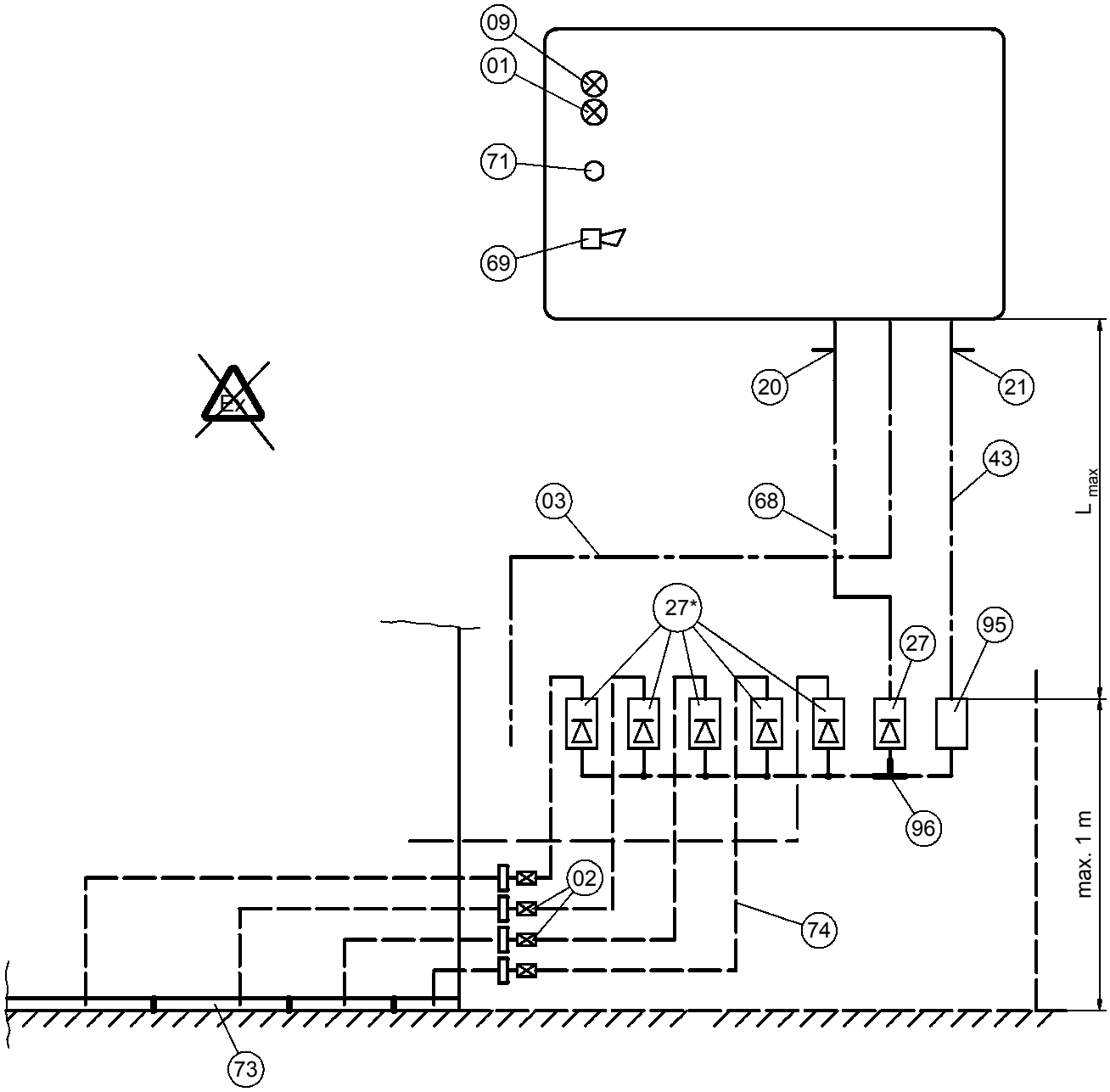

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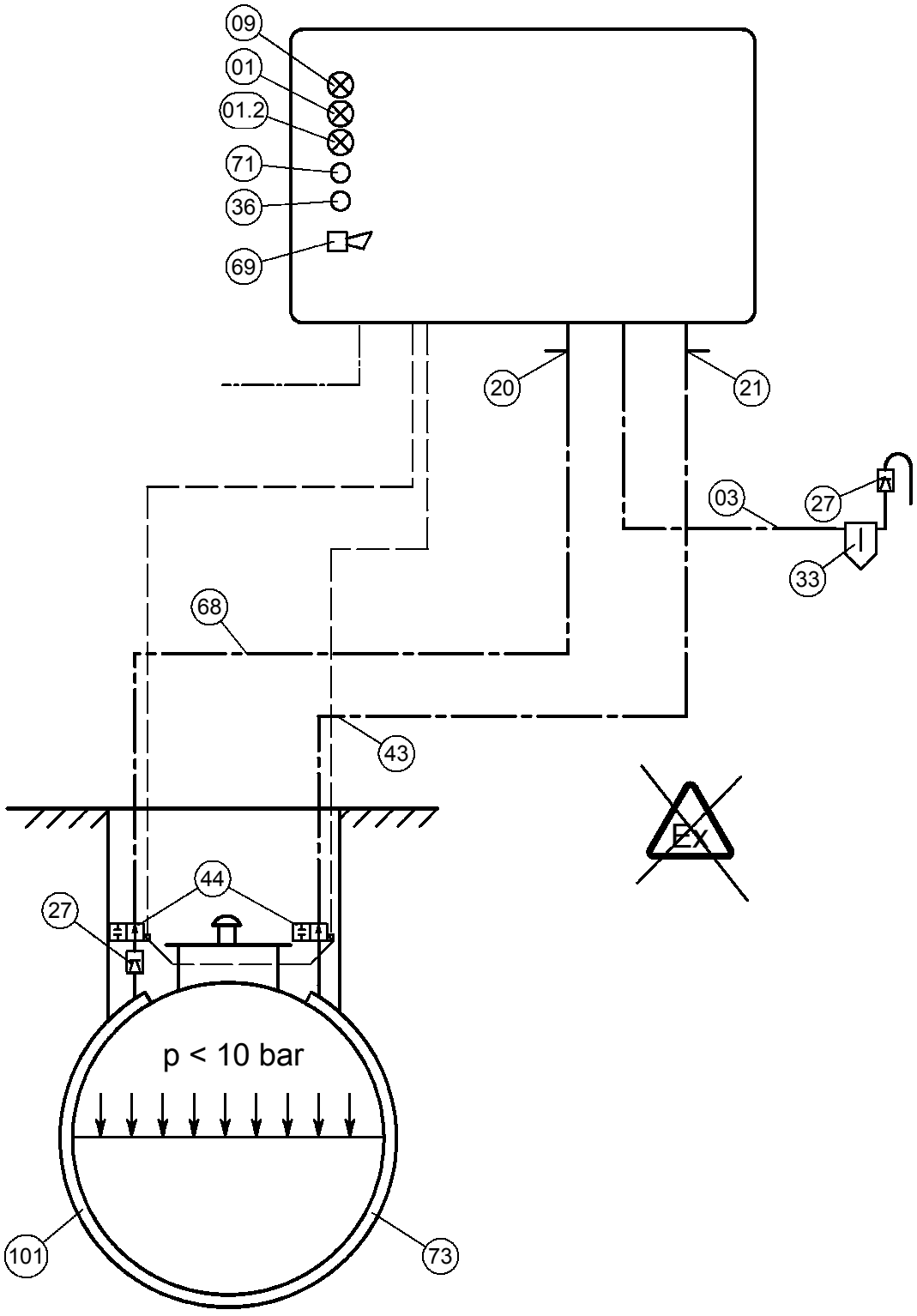

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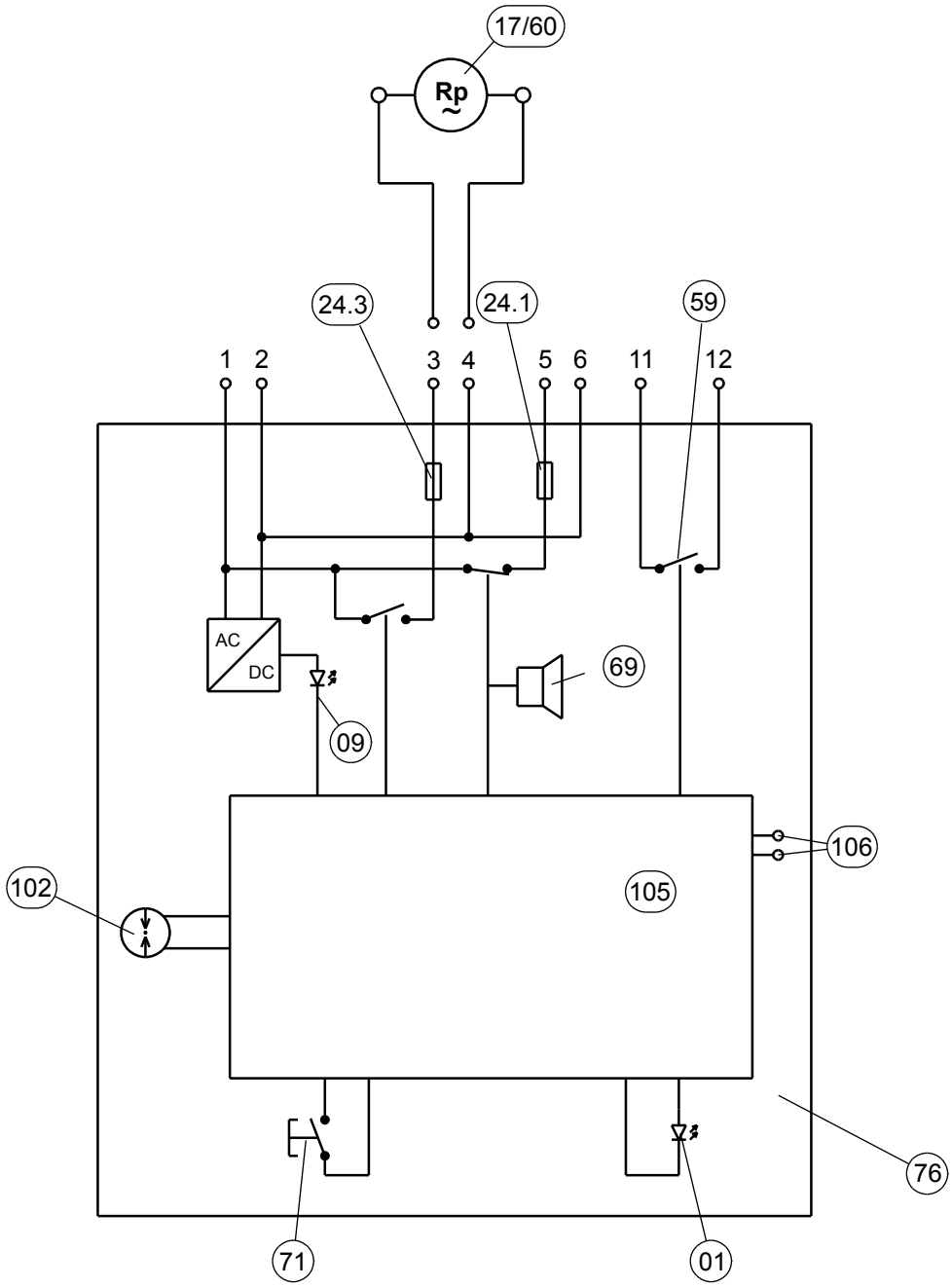

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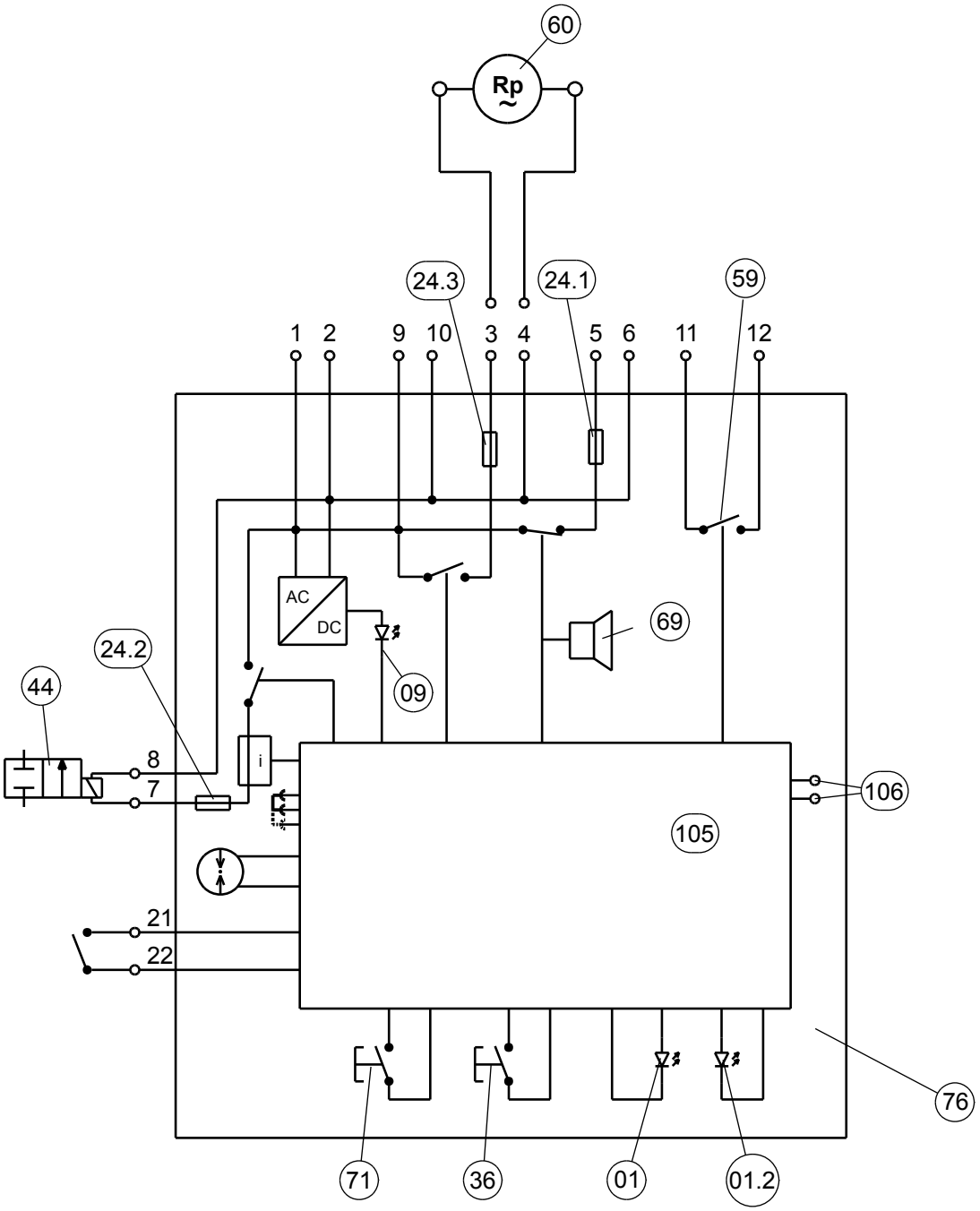

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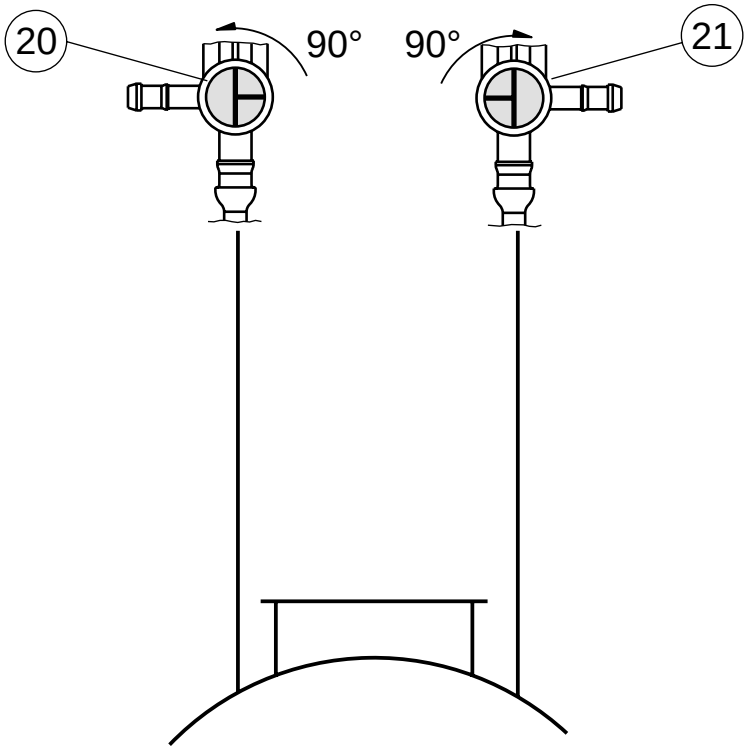

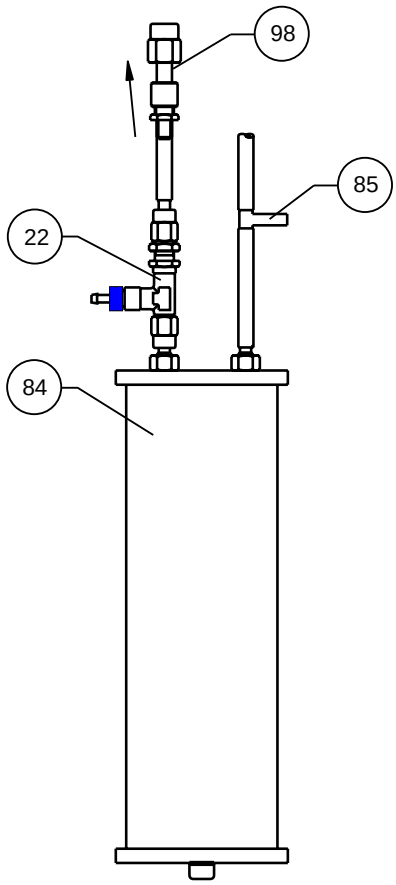

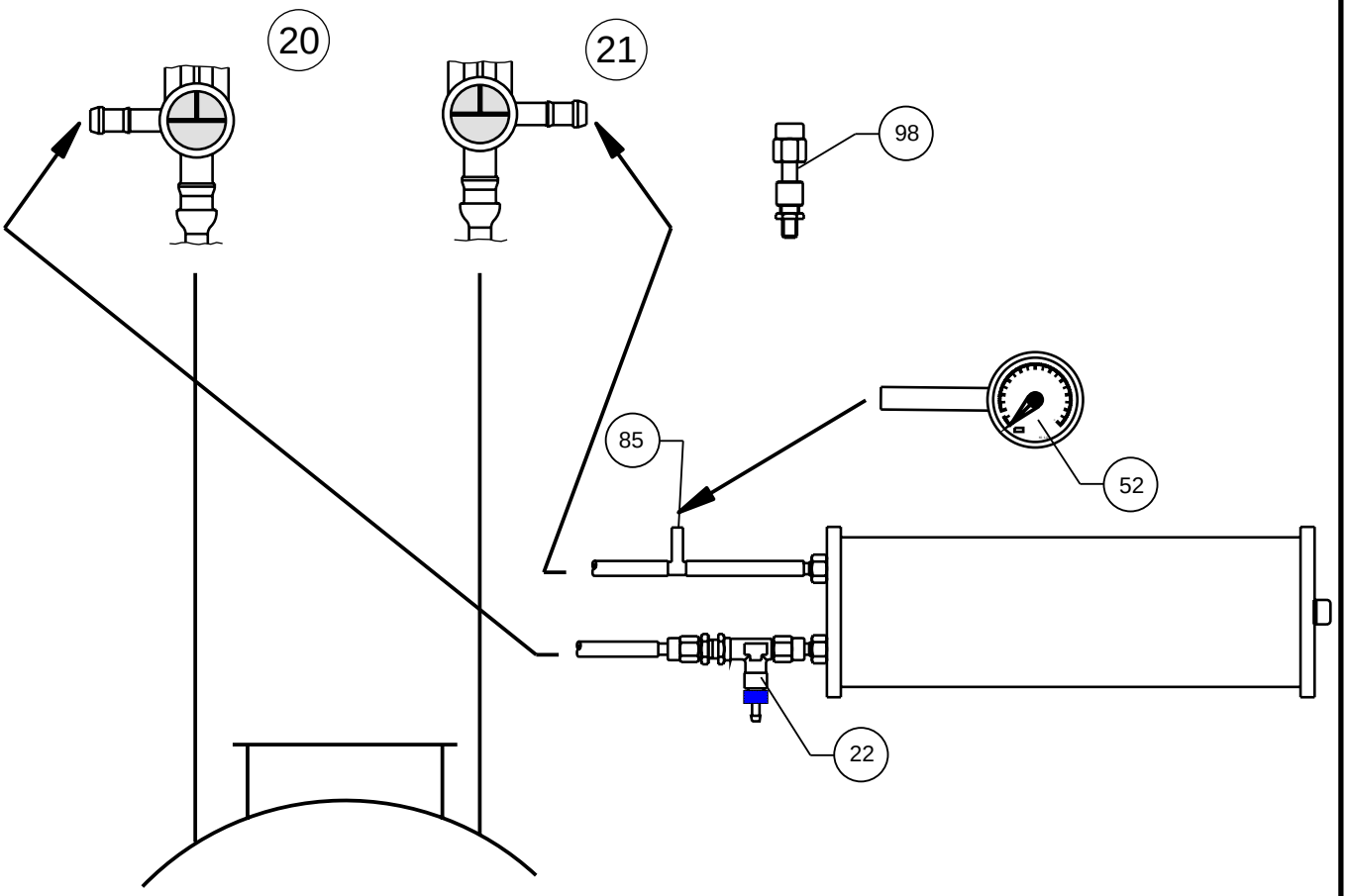

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P - 115 392

Use of the vacuum leak detector VL .. on interstitial spaces filled with leak detection liquid

A.1 Pre-conditions

(1) Only leak detectors with suitable alarm pressures may be used, depending on the diameter of the tank and the density of the stored product.

(2) The procedure described in the following is designed for tanks in compliance with DIN 6608.

(3) If this procedure is carried out on other tanks, agreement with the local authority responsible is required in individual cases.

A.2 Preparation

(1) Dismount the leak detector on liquid basis.

(2) Suction the leak detection liquid out of the interstitial space:

(3) Suction procedure:
– Mount the adapters for suction and measuring line
– Connect the installation pump to the suction line connection via an intermediate tank[1]
– **Suction off until there is no more liquid drawn in**
– Connect the vacuum measuring gauge to the measuring line connection
– Continue the evacuation process (at approx. 500 mbar) until no more liquid is suctioned
– Repeat the evacuation process after a break if necessary to make sure a gas buffer is created above the remaining leak detection liquid.

A.3 Mounting and starting-up the leak detector

(1) A gas buffer has been created above the leak detection liquid due to the suction process.

(2) Mount the leak detector according to the documentation and start operation.

(3) Carry out a functional test on the leak detector.

A.4 Alarm

(1) An alarm can occur if insufficient leak detection liquid was suctioned off and the level of liquid has increased in the interstitial space due to an increase in temperature.
Remedy:
Create a new air buffer above the leak detection liquid.

(2) An alarm can also be triggered by the penetration of groundwater / product to be stored or air in the interstitial space and an increase in liquid level connected with this.
Remedy:
Look for the leak and eliminate if necessary, then put the leak detector back into operation. If the leak cannot be located or repaired, consult the specialist responsible on site to clarify further procedure.

[1] The liquid suctioned off is collected in this tank.

E.1 H_{max} Depending on density

In this appendix, VL .. stands for all versions, i.e. also for VLR .. or VLR ../E

Density of the product stored [kg/dm³]	$H_{max.}$ [m]						
	VL 230	VL 255	VL 330	VL 410	VL 500	VL 570	
0.8	2.6	2.9	3.8	4.8	6.0	6.9	Aboveground tank(s) and pipe(s)
0.9	2.3	2.6	3.4	4.3	5.3	6.1	
1.0	2.0	2.3	3.1	3.9	4.8	5.5	Above- and under-ground tank(s) / pipe(s)
1.1	1.9	2.1	2.8	3.5	4.4	5.0	
1.2	1.7	1.9	2.6	3.2	4.0	4.6	
1.3	1.6	1.8	2.4	3.0	3.7	4.2	
1.4	1.5	1.6	2.2	2.8	3.4	3.9	
1.5	1.4	1.5	2.0	2.6	3.2	3.7	
1.6	1.3	1.4	1.9	2.4	3.0	3.4	
1.7	1.2	1.4	1.8	2.3	2.8	3.2	
1.8	1.1	1.3	1.7	2.2	2.7	3.1	
1.9	1.1	1.2	1.6	2.0	2.5	2.9	

E.2 Max. Tank height depending on density

Density of the product stored [kg/dm³]	$H_{max.}$ [m]							
	VL 34	VL 230	VL 255	VL 330	VL 410	VL 500	VL 570	
0.8	7.5	17.3	19.1	23.4	23.8	24.5	24.2	Above-ground tanks
0.9	6.6	15.3	17.0	20.8	21.1	21.8	21.5	
1.0	6.0	13.8	15.3	18.7	19.0	19.6	19.4	Above- and underground tanks
1.1	5.4	12.6	13.9	17.0	17.3	17.8	17.6	
1.2	5.0	11.5	12.8	15.6	15.8	16.4	16.2	
1.3	4.6	10.6	11.8	14.4	14.6	15.1	14.9	
1.4	4.3	9.9	10.9	13.4	13.6	14.0	13.8	
1.5	4.0	9.2	10.2	12.5	12.7	13.1	12.9	
1.6	3.7	8.6	9.6	11.7	11.9	12.3	12.1	
1.7	3.5	8.1	9.0	11.0	11.2	11.5	11.4	
1.8	3.3	7.7	8.5	10.4	10.6	10.9	10.8	
1.9	3.1	7.3	8.1	9.8	10.0	10.3	10.2	

E.3 Tanks according to DIN 6618 T2: 1989 and tubs with vaulted base and the same dimensions

Diameter [mm]	Height [mm]	Max. density of the product stored [kg/dm^3]						
		VL 34	VL 230	VL 255	VL 330	VL 410	VL 500	VL 570
1600	≤ 2 820	≤ 1.9	≤ 1.9	≤ 1.9	≤ 1.9			
	≤ 3 740	≤ 1.6	≤ 1.9	≤ 1.9	≤ 1.9			
	≤ 5 350	≤ 1.6	≤ 1.9	≤ 1.9	≤ 1.9			
	≤ 6 960	≤ 1.6	≤ 1.9	≤ 1.9	≤ 1.9			
2000	≤ 5 400	≤ 1.4	≤ 1.9	≤ 1.9	≤ 1.9			
	≤ 6 960	≤ 1.4	≤ 1.9	≤ 1.9	≤ 1.9			
	≤ 8 540	≤ 1.4	≤ 1.9	≤ 1.9	≤ 1.9			
2500	≤ 6 665	≤ 1.0	≤ 1.9	≤ 1.9	≤ 1.9			
	≤ 8 800	≤ 1.0	≤ 1.9	≤ 1.9	≤ 1.9			
2900	≤ 8 400	≤ 0.9	≤ 1.9	≤ 1.9	≤ 1.9			
	≤ 9 585	≤ 0.9	≤ 1.9	≤ 1.9	≤ 1.9			
	≤ 12 750	≤ 0.8	≤ 1.2	≤ 1.2	≤ 1.6			
	≤ 15 950	-	≤ 1.0	≤ 1.0	≤ 1.2			

E.4 Series of interstitial spaces in battery tanks

- From Messrs Berolina Polyester GmbH & Co. KG according to General Approval No. Z-40.11-165 from the Building Inspection Authorities.

Technical data

1. General data

Temperature range (operation and storage)	Plastic housing Stainless-steel h.	0–40 °C -40 °C–60 °C
Max. height for safe operation		≤ 2000 m above sea level
Max. relative humidity for safe operation		95 %
Buzzer volume		> 70 dB (A) in 1 m
Housing protection class	Plastic housing Stainless-steel h.	IP 30 IP 66
Version with solenoid valve		< 10 bar (pressure in inner tank)

2. Electrical data

Electrical supply (without external signal)			230 VAC, 50 Hz, 50 W 24 VDC, 50 W
Supply tolerance (network)			± 10 %
Switch contact load, terminal strips AS (5 and 6)	230 VAC	max: min:	230 VAC, 50 Hz, 200 VA 20 mA
	24 VDC	max:	24 VDC, 50 VA
Switch contact load, dry relay contacts (Terminals 11 and 12)		max: min:	230 VAC, 50 Hz, 3 A 6 V / 10 mA
External fuse for the leak detector			max. 10 A

Note: Acts as a separating point for the device and should be attached as close as possible!

Overvoltage category	2
Degree of soiling	PD2

3. Pneumatic data (requirements concerning the test measuring gauge)

Nominal size	min. 100
Accuracy class	min. 1.6
Scale end value	-600 mbar / -1000 mbar

4. Data for applications that fall under the Pressure Equipment Directive (PED) in case of an error

Note: The leak detector, installation kits, and manifolds are pressure accessories without a safety function in case of an error of the monitored system.

Volume leak detector:	0,05 liter
Max. operating pressure in case of an error - with solenoid valve (MV):	10 bar
Volume installation kit:	< 1,67 liter
Max. operating pressure in case of an error:	25 bar

Evaluating the display for the function "Tightness test"

Chapter 3.5.2 described "Checking the tightness of the monitored system". This function can be used to obtain an indication of the tightness of the monitored system.

This is only possible if the switching value "Alarm OFF" has been exceeded. It can be repeated several times in succession.

This check is advisable **before** carrying out a recurrent function test on a leak detector, to see directly whether there is any need to look for leaks.

After pressing the button, this is confirmed by a brief audible signal which can be heard once, followed by a flashing signal, i.e. the Alarm LED flashes briefly to indicate the tightness as follows:

Number or flashes	Evaluation of the tightness
0	Very tight
1 bis 3	Tight
4 bis 6	Sufficient tight
7 bis 8	Maintenace recommended
9 bis 10	Maintenace highly recommended

The smaller the above value, the more tight is the system. The meaningfulness of this value naturally also depends on temperature fluctuations and should therefore be considered to be an indicative value.

Using the VL .. underpressure leak detector on tanks which have been allowed to warm up

The following example applications are described in this appendix:

W.1: Tank for storing liquids which are viscous or have a tendency to solidify at ambient temperature (temperatures >50°C and <150°C), and where a sufficient length of the measuring line has been routed inside the tank insulation, or for tanks used to store liquids which remain thin at ambient temperature.

W.2: Tank for storing liquids which are viscous or have a tendency to solidify at ambient temperature (temperatures >50°C and <150°C), and where only a short length of the measuring line has been routed inside the insulation.

W.3: Tanks which are filled with hot product quickly; in other words, the temperature of the filled product is more than 25°C higher than the temperature of the tank (worst case scenario), introducing the risk of false alarms.

The design and dimensioning of the leak detector for a heated tank (chapters W.1 and W.2) is significant on account of the temperature resistance of the leak detector components used. In these applications, either a sufficient cooling section or a system of leak sensors in conjunction with solenoid valves (instead of a liquid stop valve) needs to be used in order to ensure that alarms will be triggered correctly.

Tanks which are filled with hot products (chapter W.3) experience a change in temperature in the interstitial space and therefore a change in pressure (drop in underpressure). False alarms which might be triggered due to this rise in pressure need to be avoided if at all possible.
Both aspects can even be significant simultaneously (particular care must be taken to monitor the leak detector system especially when heating or filling a tank for the first time)[1].

The interstitial spaces of the above tanks should be dry prior to starting up the leak detector (if they are not, they should be dried in order to ensure that the leak detector will function correctly).

W.1 Tanks with heating (and insulation) at temperatures > 50°C and < 150°C (design with cooling section)

(1) This design requires that the parts of the interstitial space which are used for pressure reduction[2] are sufficiently heated or that the product inside the tank remains sufficiently thin at ambient temperature.

(2) Check whether special switching values might be necessary (see W.3).

(3) A cooling section approx. 3 m in length (spiralled pipe) is installed between the mounting set and the liquid stop valve in order to prevent impermissible increases in temperature at the liquid stop valve. In most cases the liquid stop valve is then installed underneath the leak detector.

(4) Metal pipes have to be used for reasons associated with temperature.

W.2 Tanks with heating (and insulation) at temperatures > 50°C and < 150°C (design with sensor in suction line)

(1) Check whether special switching values might be necessary (see W.3).

[1] Cases have even been known of overpressure caused by heat rise, introducing the risk of damage to the interstitial space.
[2] Volume displacement in the event of a liquid leak in the interstitial space/measuring line.

(2) Selection of the lines connecting the mounting set and the leak detector.
Use of metal pipes, Cu or VA pipes. Plastic pipes are not suitable.
The between the leak detector and the mounting set must be at least 3 m in length. This will ensure that the warm (hot) air extracted from the interstitial space can cool down before it reaches the leak detector.

(3) Installing the leak detector.
The leak detector (including the solenoid valves in the suction and measuring lines) has to be installed so that the ambient temperature of 60°C (e.g. radiant heat from the tank) is not exceeded.

(4) Installation of the mounting set
The ambient temperature at the mounting kit must not exceed 100°C and the temperature of the medium must not exceed 150°C.
If the mounting set needs to be installed inside the tank insulation, care must be taken to ensure that this does not impair accessibility (so that the annual functional test of the leak detector can still be carried out).

(5) Special condition for the mounting set (suction line side)
The operator/system integrator must ensure that in the event of a leak, the product inside the tank will remain free-flowing even in the condensate trap.
Suitable measures, such as heating the condensate trap (e.g. with a heater band) might need to be introduced.

(6) To exclude the risk of the leak detector pump overheating, underpressure must be generated with a suitable installation pump.

(7) A float switch (vertical installation position) can be used as a sensor. Alternatively, a vibrating fork sensor (any installation position) can be used.

W.3 Tanks filled with hot product (temperature difference in relation to the product inside the tank > 25°C)

(1) Calculation of the (potential) special switching value requirements in order to ensure reliable alarm triggering on the one hand and to prevent false alarms due to heat rise on the other.
What is important for this calculation is that the differences in temperature are known, and that the rate at which the temperature in the interstitial space changes can be approximated.

(2) Please see W.2 for information about installing the leak detector, selecting connecting lines and installing the mounting set.

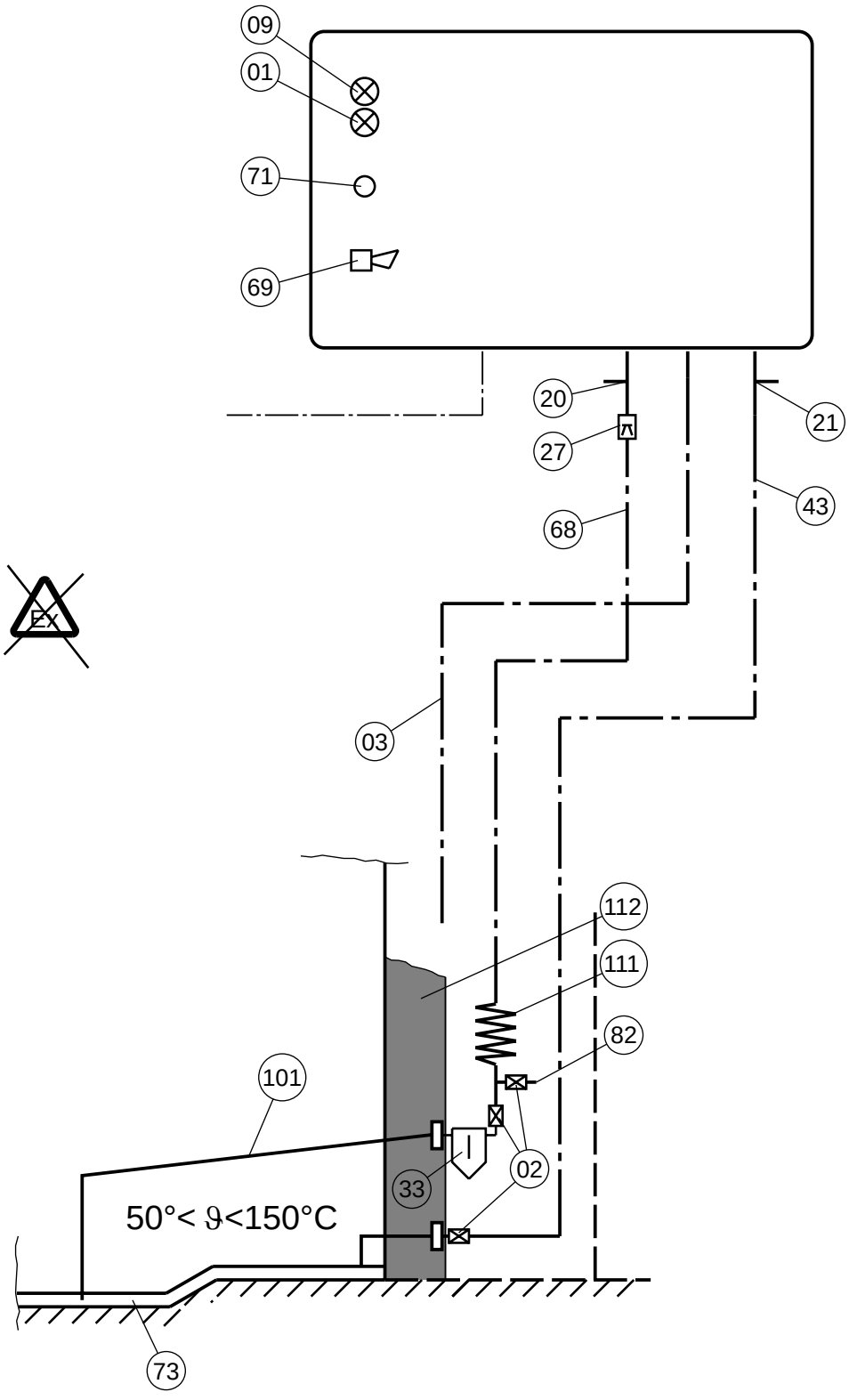
Commissioning the leak detector

(1) Chapters 5 and 6 describe how to commission the leak detector and test its function. Compliance with the information in the sections of text describing the VL./E model and the use of solenoid valves should be ensured where applicable.

Triggering of an alarm

(1) Please see chapter 6.5 of the documentation.

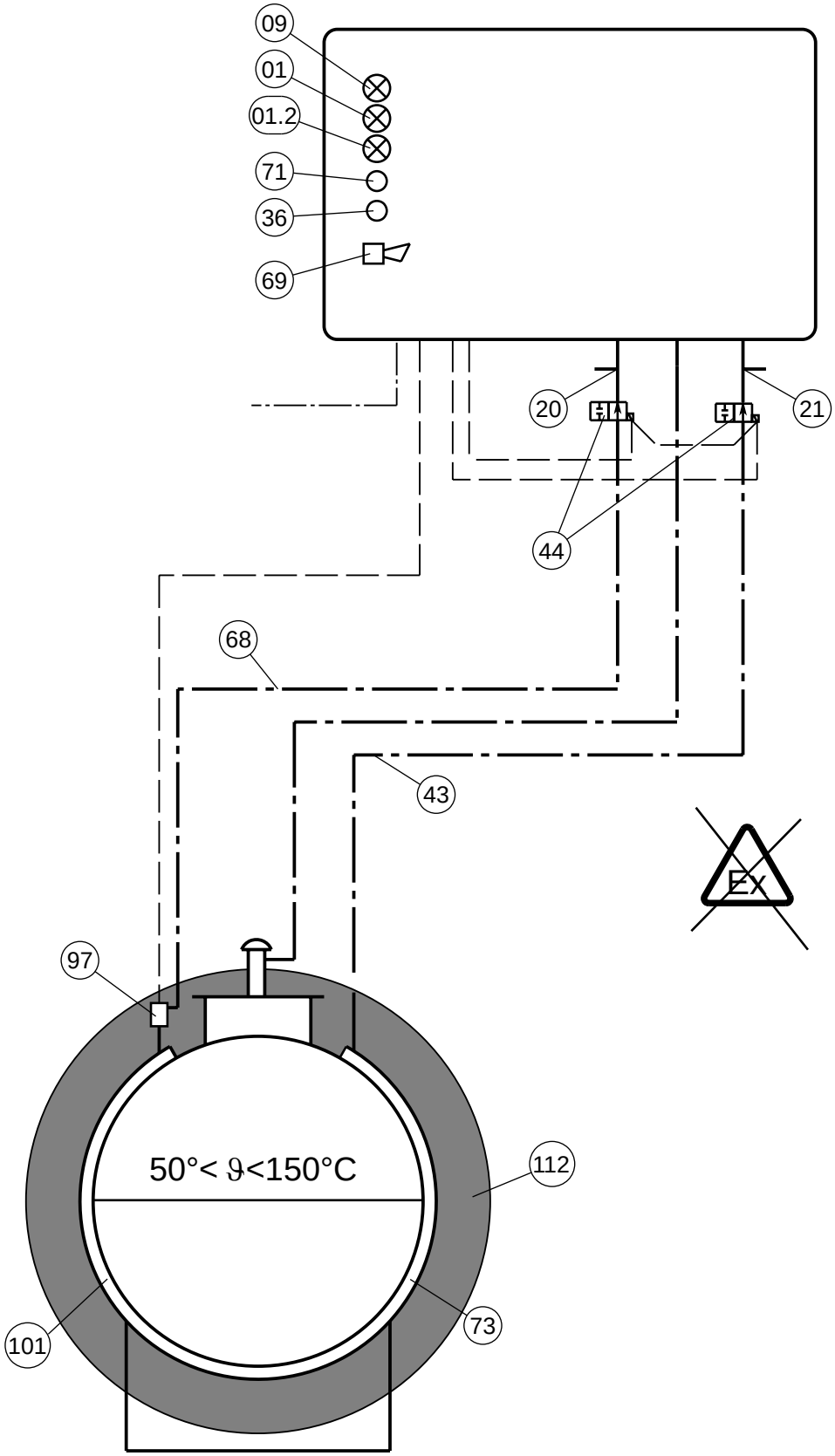
(2) Note (for version with sensor and solenoid valves): If liquid manages to reach as far as the sensor, the solenoid valves will remain closed even if the commissioning sequence is completed.



15-07-2008

SGB

W - 01



15-07-2008

SGB

W - 02

Programming level indicator VL .. FA7

Display (multi-digit) for automatically alternatingly display of the filling in liters, percentage and centimeters.

Button (for the configuration/start of the filling level measurement)

1. Field of application

The integrated filling level indicator FA7 serves to identify the filling level of diesel and fuel oil in the connected container. It is compatible with all shapes of tanks, barrels and cisterns.

Note: If you would like to measure the filling level of any other kind of liquid than fuel/diesel oil, please contact the manufacturer/supplier.

2. Programming/Commissioning

A) Start

Press the button until you hear the acoustic confirmation signal (double note/vibration). “Tank” will appear on the display.

B) Setting the type of the tank

By pressing the button shortly, the type of tank will be chosen. By pressing long, the choice is confirmed. Available tank types:

- Cylindrical = cyl.
- Ball-shaped
- Cube

C) Setting of tank height/volume

C1: For cylindrical and cubical tanks the height and the volume are to be set.

First, there is a 3-digit display. The digits for centimeters, decimeters and meters are programmed one after the other starting with the ones, followed by the tens and hundreds.

The value is changed by a short key press and confirmed by a long key press.

After confirming the tank height, “Liter” will appear in the display. Enter the maximum capacity of the container from the right to the left as before.

The maximum content is: 99.999 l

C2: For ball-shaped containers only the liter input is required.

A 5-digit liter display appears Here, from right to left, enter the maximum capacity of the container in liters. The value is changed by a short key press and confirmed by a long key press.

D) First measurement

After confirming the entire contents, the first measurement automatically starts. The tank contents are now automatically displayed alternately in liters, percent and centimeters.

Note: Modify the programming

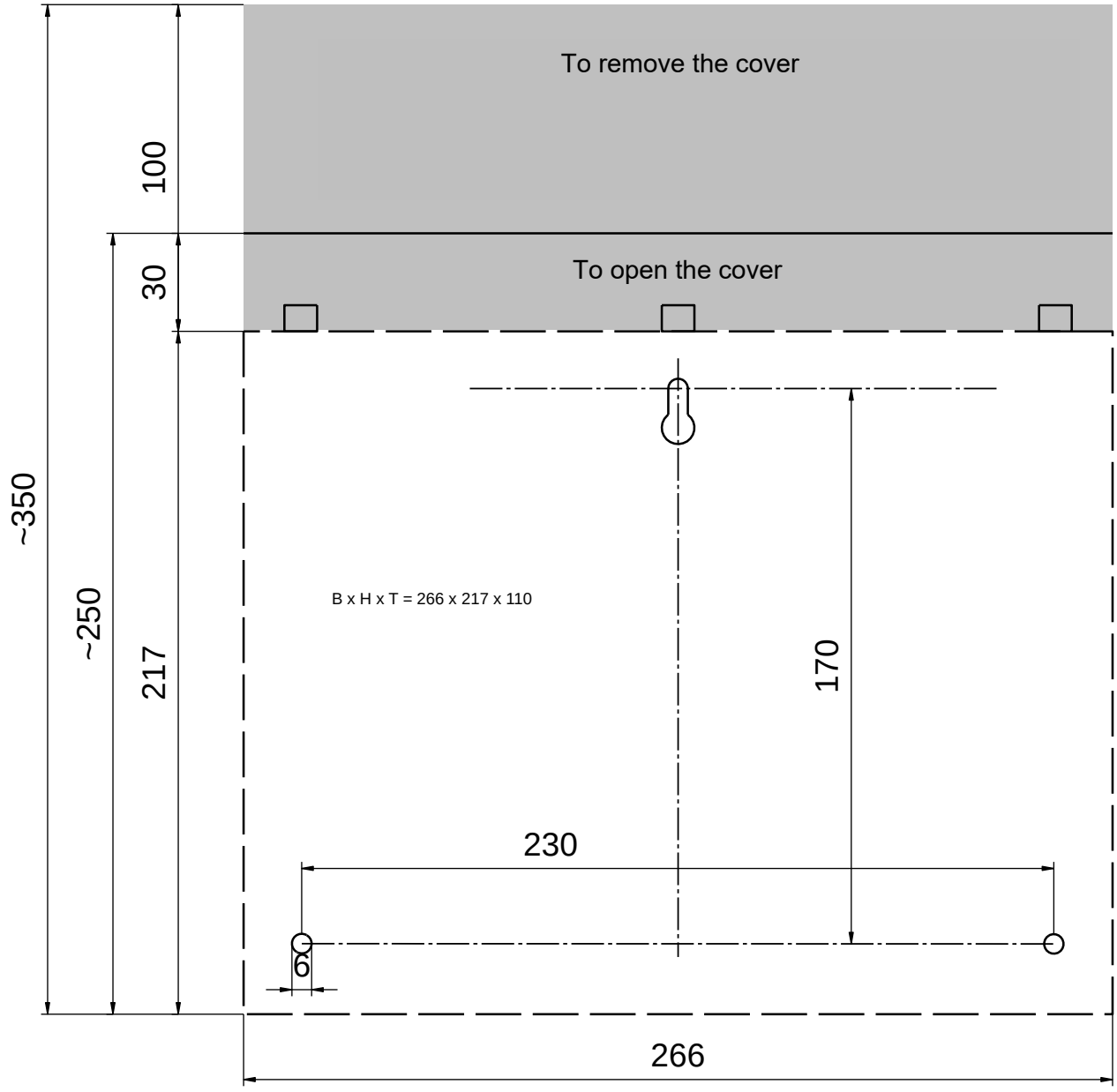
If you have to change any data, you have to start the programming from the beginning.

3. Operation

- Start the measurement by pressing the key
- After a short time, the filling level in l, % and cm will appear.
- Carry out a second measurement for control measures. If need be, measure multiple times until the filling level display is stable.

4. Technical Data

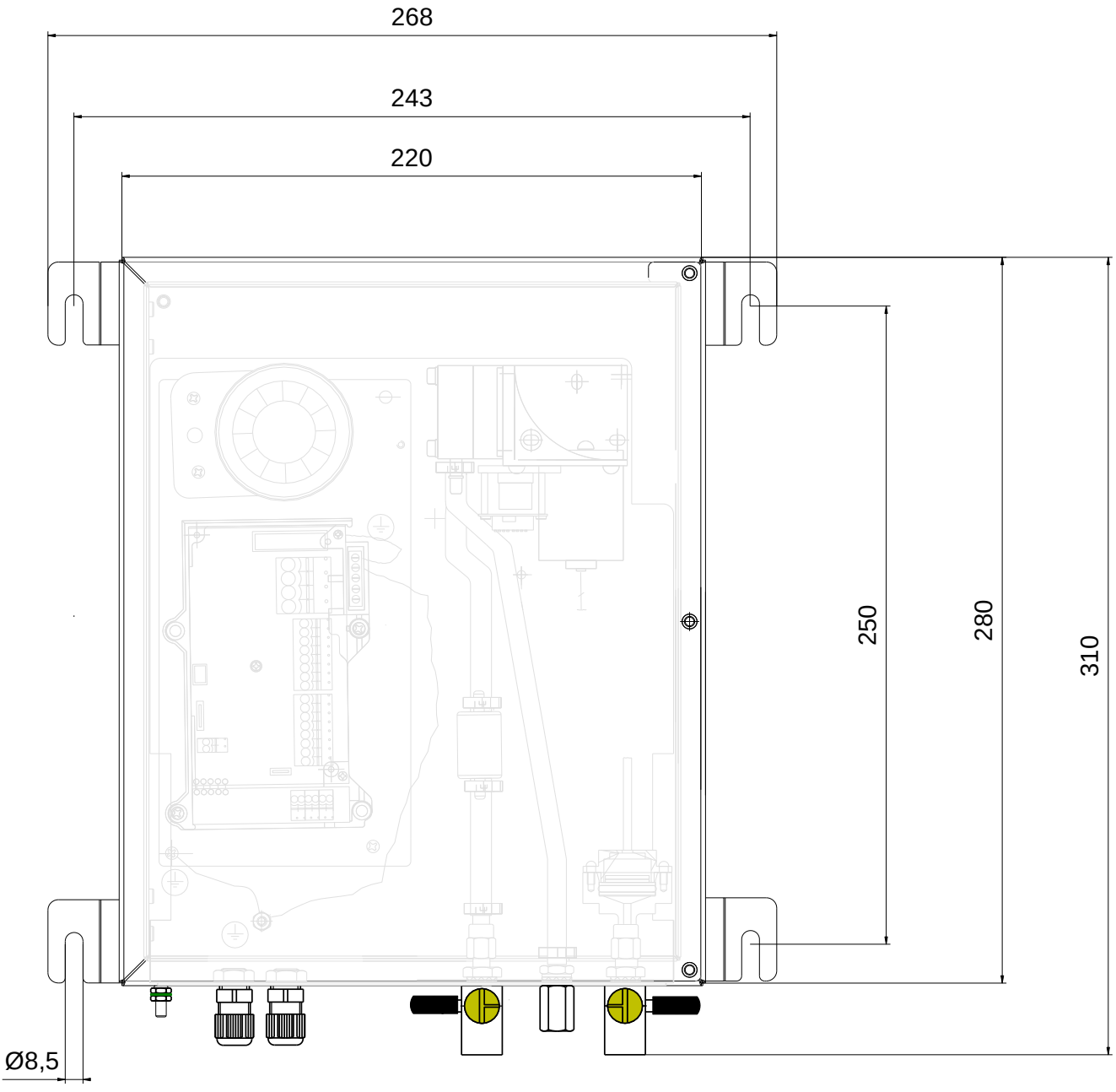
Measuring principle:	hydrostatic pressure
Max. filling level:	300 cm fuel oil column
Tolerance:	± 1 cm
Power supply:	via leak detector



18-11-2003

SGB

Dimension/Drilling
Plastic housing



D = 120 mm

28-06-2005

SGB

Dimension/Drilling
Stainless-steel housing

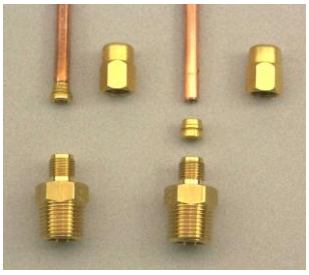
Work sheet: AB-820 500

Installation of screw connections

1 Flanged screw connection for flanged pipes

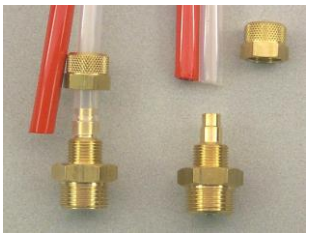
1. Oil o-rings
2. Place the intermediate ring loosely in the screw connection sleeve
3. Push the union nut and pressure ring over the pipe
4. Tighten the union nut by hand
5. Tighten the union nut until there is a noticeable increase in force
6. Final installation: Turn ¼ turn further

2 Clamping ring screw connection for plastic and metal pipes



1. Insert support sleeve (only plastic pipe) into the pipe end
2. Insert the pipe (with support sleeve) as far as it will go
3. Tighten nut of screw connection by hand to the resistance; then turn further 1¾ turns with the wrench
4. Release nut
5. Tighten nut by hand until stronger resistance
6. Final assembly of the screw connection by tightening ¼ turn

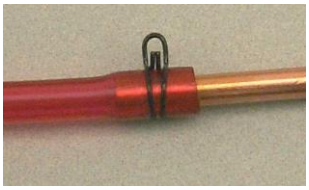
3 Quick-release screw connection for PA and PUR hose

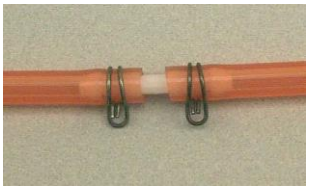


1. Cut the PA pipe to length at a right angle
2. Unfasten the union nut and push it over the end of the pipe
3. Push the pipe onto the nipple up to the start of the thread
4. Tighten the union nut by hand
5. Re-tighten the union nut with a screwdriver until there is a noticeable increase in force (approximately 1 to 2 turns)

NOT suitable for PE hose

4 Hose connections (4 and 6 mm nozzle for OVERPRESSURE)





1. Push the wire or screw clip over the hose
2. Push the hose onto the Cu pipe or hose nozzle (heat or moisten PVC hose as necessary). The hose must fit tightly all round
3. Wire clip: press together with pliers and push onto the connection point
   Screw clip: push onto the connection point and tighten with screw-driver
   Make sure that the clip is an even tight fit.

5 Hose connections (4 and 6 mm nozzle for NEGATIVE PRESSURE)

For negative pressure applications with which there is no overpressure on the connection lines even in case of a leak, as point 5 but without clips.

For negative pressure applications with which there may be overpressure, as point 5.

EU DECLARATION OF CONFORMITY

We,

SGB GmbH
Hofstraße 10
57076 Siegen, Germany,

hereby declare in sole responsibility that the leak detector

VL ..

comply with the essential requirements of the EU directives listed below.

This declaration shall lose its validity if the device is modified without consulting us.

Number / short title	**Satisfied regulations**
2014/30/EU EMC Directive	EN 61000-6-3:2007 / A1:2011 EN 61000-6-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013
2014/35/EU Low Voltage Directive	EN 60335-1:2012 / A11:2014 / A13:2017 / A1:2019 / A2:2019 / A14:2019 EN 61010-1:2010 / A1:2019 EN 60730-1:2011
2014/68/EU Pressure Equipment Directive	Pressure accessory without safety function

Compliance is declared by

ppa. Martin Hücking
(Technical Director)

Declaration of Performance (DoP)

Number: **001 EU-BauPVO 2014**

1. Distinct identification code of the product type:

   Vacuum leak detector type VL ..

2. Purpose of use:

   Class I vacuum leak detector for monitoring double-walled tanks

3. Manufacturer:

   SGB GmbH, Hofstraße 10, 57076 Siegen, Germany
   Tel.: +49 271 48964-0, E-Mail: sgb@sgb.de

4. Authorized representative:

   n/a

5. System for the evaluation and inspection of the reliability of performance:

   System 3

6. In the case of the declaration of performance, which applies to a building product, which is covered by a harmonized standard:

   Harmonized standard: EN 13160-1-2:2003
   Notified body: TÜV Nord Systems GmbH & Co.KG, CC Tankanlagen, Große Bahnstraße 31, 22525 Hamburg, Germany
   ID number of the notified test laboratory: 0045

7. Declared performance:

Essential features	Performance	Harmonized standard
Pressure switch point	Passed	EN 13160-2: 2003
Reliability	10,000 Cycles	
Pressure test	Passed	
Volume flow rate test in the alarm switch point	Passed	
Function and leak tightness of the leak detection system	Passed	
Temperature resistance	-20°C .. +60°C	

8. Signed for the manufacturer and in the name of the manufacturer by:

   Dipl.-Ing. M. Hücking, Director of Operations
   Siegen, 02/2021

Manufacturer's declaration of compliance

SGB
MVV TB
Anhang C 2.15.15
TÜV-NORD

Compliance with the "Muster-Verwaltungsvorschrift Technische Baubestimmungen" (sample administrative regulation technical building regulations) is hereby declared.

Dipl.-Ing. M. Hücking, Director of Operations
Siegen, 02/2021

Note: By TÜV Nord not certified translation of the German original version

TÜV NORD Systems GmbH & Co. KG
PÜZ (testing, supervision and certification) — centre for containers, pipelines and pieces of equipment for systems with substances hazardous to water

Große Bahnstraße 31.22525 Hamburg Tel.: 040 8557-0 hamburg@tuev-nord.de
Fax: 040 8557-2295 www.tuev-nord.de

Certification

Contracting body:

SGB GmbH
Hofstraße 10
D-57076 Siegen

Manufacturer:
See above

Subject of testing:

Leak detectors with leak detector system type VL .../VLR ... according to DIN EN 131601:2003 and DIN EN 13160-2:2003
Class I vacuum monitoring system

Type of test:
Testing of the building product before confirming conformance in line with the ÜHP (manufacturer's declaration of conformity) procedure (initial testing)

Testing period: 19.06. – 08.12.2014

Test results:
The leak detectors of type VL .../VLR ... as vacuum systems correspond to the leak monitoring system class I according to EN 13160-1:2003 and meet the requirements of EN 13160-1:2003 in conjunction with EN 13160-2:2003.
Regarding the area of application and the installation of the leak detectors, the specifications given in the following shall apply:
- operating manual "Vacuum Leak Detector VL ..", document no. 605.300, updated 12/2014,
- operating manual "Vacuum Leak Detector VLR", document no. 605.400, updated 12/2014.
Compatibility with the building regulation list A, part 1, order No. 15.43, appendix is confirmed.

Details on testing can be found in the test report PÜZ 8111391811 dated 08.12.2014 for leak detectors type VL 330.

Hamburg, 08.12.2014

Note:
By TÜV not certified translation of the German original version

TÜV NORD Systems GmbH & Co. KG
Manufacturer Certification Competence Center

Grosse Bahnstrasse 31, D-22525 Hamburg
Phone: 040 8557-0
Fax: 040 8557-2295
hamburg@tuev-nord.de
www.tuev-nord.de

Certificate no. 8117744963-2

Subject of the test:	**Underpressure leak detector type VL(R)..**
Client:	SGB GmbH Hofstrasse 10 57076 Siegen
Manufacturer:	SGB GmbH
Test type:	Type testing of an underpressure leak detector with alarm device, type VL(R) in accordance with EN 13160-2:2016. Classification of the leak detection system as per classifications in accordance with EN 13160-1:2016.
Test object	Leak detector with alarm device, type VLR 410, device no. 1912430780
Test period:	02/2020
Test location:	Accredited test laboratory at TÜV NORD Systems GmbH & Co. KG
Test results:	**In the type test, the underpressure leak detector of type VLR 410 met the essential characteristics of Table ZA.1 of EN 13160-2:2016 and corresponds to leak detection system class I in accordance with EN 13160-1:2016. The specifications in the technical description "Documentation 605 400" dated 02/2018 apply in relation to the field of application and installation.**

Note: The certificate is only valid in combination with the test report of TÜV NORD test laboratory PB 8117744963-2 dated February 19, 2020. Production inspection is not required in accordance with EN 13160-2:2016.

Hamburg, 2/21/2020

TÜV NORD Systems GmbH & Co. GK
Manufacturer Certification Competence Center

J. Straube

Warranty

Dear customer,

You have purchased a high-quality leak detector from our company.

All of our leak detectors undergo a 100% quality control examination. The type plate with the serial number is only affixed after all test criteria have been complied with.

The **warranty period** for our leak detectors is **24 months**, beginning on the date of installation on site. The maximum warranty period is 27 months from our date of sale.

Our warranty will be effective only if the customer submits to us the functional report or test report on initial putting into service, prepared by a recognised company specialised in water and water protection systems, including the serial number of the leak detector.

The warranty shall not apply in the event of faulty or improper installation or improper operation, or if modifications or repairs are carried out without the manufacturer's consent.

Our warranty does not include parts, which may be perished premature due to their consistence or category of usage (e.g., pumps, valves, gaskets, etc.). Furthermore, we are not liable for defects or corrosion damages caused by humid or inappropriate installation environments.

The warranty is also subject to our General Terms and Conditions of business (see these online at: https://sgb.de/en/contact/generaltermsandconditions).

In case of malfunction, please contact your local specialist company:

Stamp of the specialist company

Yours sincerely

SGB GmbH
Hofstr. 10
57076 Siegen
Germany

T +49 271 48964-0
E sgb@sgb.de
I sgb.de

Proprietà

DATA 4 ITALY

Progetto

DC 07
MILAN

Supervisore delegato del committente	**GIS.IMO S.r.l.** centro direzionale quattrotorri 06132 PERUGIA	Tél. : +39 075 517 29 83 Fax : +39 075 518 12 88
Assistente del committente	**GARRETTI ASSOCIATI S.r.l.** via Trieste, 9 - 20146 MILANO www.garrettiassociati.it	Tél. : +39 02 430 6931 Fax : +39 02 480 170 51
Progetto architettonico	**GARRETTI ASSOCIATI S.r.l.** via Trieste, 9 - 20146 MILANO www.garrettiassociati.it	Tél. : +39 02 430 6931 Fax : +39 02 480 170 51
Opere edili e prefabbricati	**GENERALE PREFABBRICATI S.p.a** centro direzionale quattrotorri 06132 PERUGIA www.generaleprefabbricatispa.com	Tél. : +39 075 517 29 83 Fax : +39 075 518 12 88
Impianti meccanici	**OMEGA CONCEPT IMPIANTI E SISTEMI S.p.a.** Via Chiese, 72 - 20126 - MILANO www.engie-axima.fr	Tél. : +39 02 8180951 Fax : +39 02 8135163
impianti elettrici/dati	**ENGIE CONTRACTING ITALIA S.r.l.** Via Chiese, 72 - 20126 - MILANO www.engie.com	Tél. : +39 02 94399262 Fax : +39 02 94399655
	SCHNEIDER ELECTRIC S.p.A. Via Circonvallazione Est, 1 - 24040 STEZZANO (BG) www.schneider-electric.com	Tél. : +39 0354151111 Fax : +39 0354153200
	ENERIA Rue de Longpont - BP 10202 - 91311 MONTLHERY Cedex - FRANCE www.eneria.fr	Tél. : +33 (0) 169802100 Fax : +33 (0) 169802150
Progettazione antincendio	**STUDIO TECNICO ZACCARELLI S.r.l.** via Ludovico il Moro, 17 - 20143 MILANO www.studiozaccarelli.it	Tél. : +39 02 891 200 81 Fax : +39 02 813 962 8
Supervisione	**ITALSOCOTEC S.p.a.** Via Pontaccio,12/A- 20121 Milano italsocotec@italsocotec.it	Tél. : +39 02 89051500 Fax : +39 02 89051501

Cod	Data	Descrizione
	31/01/2023	DOE

DATA 4 ITALY - DC07
Fiche technique jauge / Gauge Datasheet
Scheda Indicatore serbatoio

Jauge électrique
JE100

- **De 1250 à 3000 mm de hauteur**
- **Transmission par renvoi d'angle**
- **Montage sur manchon 2"**
- **Tête IP67**
- **2 fonctions possibles :**
  De 1 à 2 contacts secs
  1 sortie continue (Ω)

APPLICATIONS

Transmetteur de niveau en continu ou alarme niveau bas et/ou haut dans les cuves situées en intérieur ou extérieur :

Exemple de liquides :
- Fuel
- Huile
- Eau glycolée
- Eau de pluie

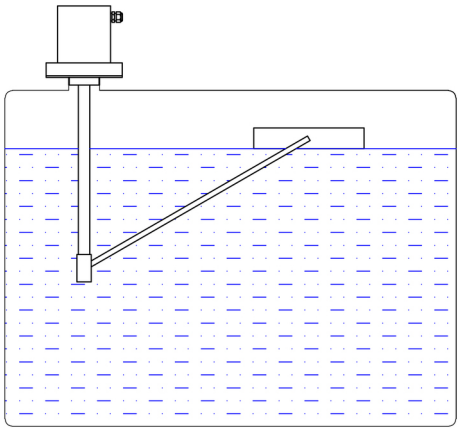
Particulièrement adapté pour répondre aux besoins et conditions d'emploi des capacités d'alimentation en fuel de groupes électrogènes placés à l'extérieur.

DESCRIPTION

Sous la poussée du fluide, le flotteur entraine un axe solidaire d'un renvoi d'angle 90°.
Ce mouvement peut agir sur un potentiomètre qui délivre une valeur ohmique image de la mesure ou des contacts pour transmettre une alarme.

La jauge électrique se positionne sur le haut de la cuve.

Le matériel est livré réglé, étalonné, et prêt à poser.



CARACTÉRISTIQUES TECHNIQUES

Matériaux	Acier, Nylon *Flotteur : PVC expansé* *Sur demande : Acier Inox 316L*
Joint Bride	en liège
Montage	Raccord 2" GAZ mâle
Tête Jauge	Nylon, IP67 1 presse étoupe de 13 mm
Pression	Atmosphérique
Température	De 0 à 40 °C
Contacts	Réglage par défaut : 1 ou 2 contacts inverseurs, 10 A, 230 V, libre de potentiel Alarme niveau haut : 90% Alarme niveau bas : 25% *Autres réglages possibles de 20 à 90 % sur demande.*
Sortie ohmique	Potentiomètre De 0 à 215 Ω (indicatif, ±15 %)

579

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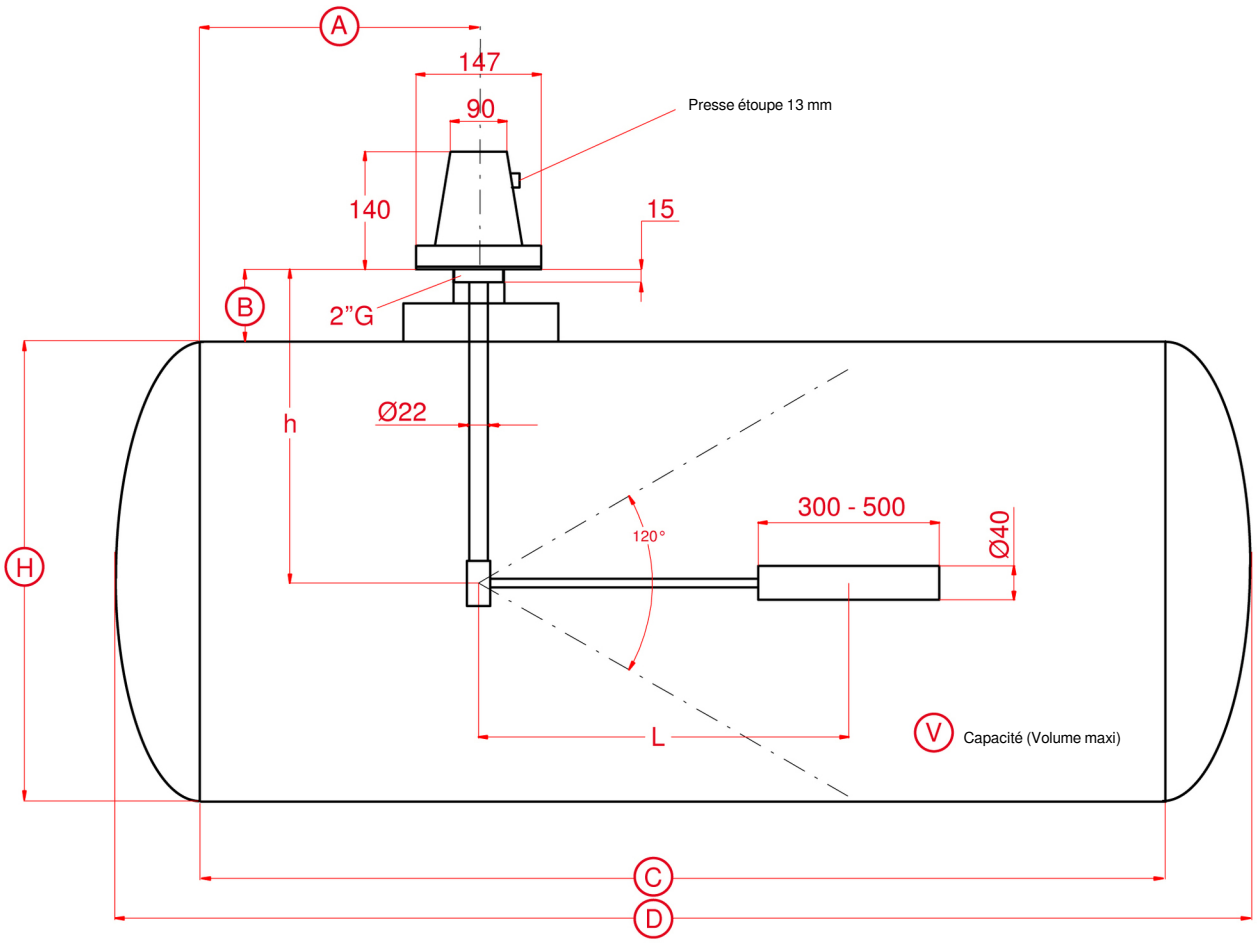
CODES ET RÉFÉRENCES

Code	Référence	Description
579 010	JE100	Sortie ohmique
579 012	JE100 C	Sortie ohmique + 1 contact (alarme niveau BAS)
579 639	CE-102 IP67	1 contact (alarme niveau BAS)
579 643	CE-103 IP67	2 contacts (alarme niveau BAS et HAUT)

DIMENSIONS

Schéma d'encombrement (non à l'échelle)



Les cotes A, B, C, D et H ainsi que la capacité V du réservoir sont à fournir par le client.
Si le réservoir a une forme rectangulaire, le client doit également préciser sa largeur.

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Electric gauge
JE100

- **Tank height from 1250 to 3000 mm**
- **Transmission: angle drive**
- **Fitting: male 2” BSP**
- **Head housing: IP67**
- **2 possible functions:**
  With 1 or 2 contacts, potential free
  With continuous resistive signal (Ω)

579

APPLICATIONS

These controllers for alarms on low, high levels, and transmitters of continuous level, are designed for indoor or outdoor tanks.

Liquid storage examples:
- Diesel
- Lubricating oil
- Glycol water
- Rainwater

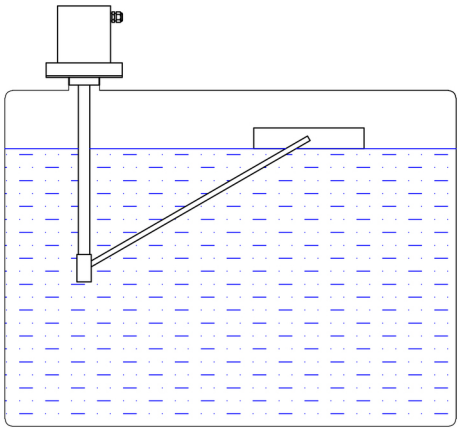
They are particularly well adapted to use and needs of storage or day-tank on diesel generators located outdoor.

DESCRIPTION

Under the thrust of the fluid, the float transmits the level through an angle drive to a vertical stem.
The stem is then actuating a potentiometer (resistive output) and/or actuates contacts (alarms).

The electric gauge is mounted above the tank.

The complete system is supplied ready to install and to use.



TECHNICAL FEATURES

Materials	Steel, Nylon *Float: Foamed PVC* *On request: Stainless steel (316L)*
Flange seal:	Cork gasket
Mounting	BSP 2", male fitting
Head housing	Nylon, IP67 1 pressure gland 13 mm
Pressure	Atmospheric
Temperature	Between 0 and 40 °C
Contacts	Default setting: 1 or 2 contacts (2 way contact), 10 A, 230 V, potential free HIGH level alarm: 90 % LOW level alarm : 25 % *On request: Factory adjustment between 20 and 90 %.*
Continuous signal output	Resistive signal From 0 to 215 Ω (approx., ±15 %)

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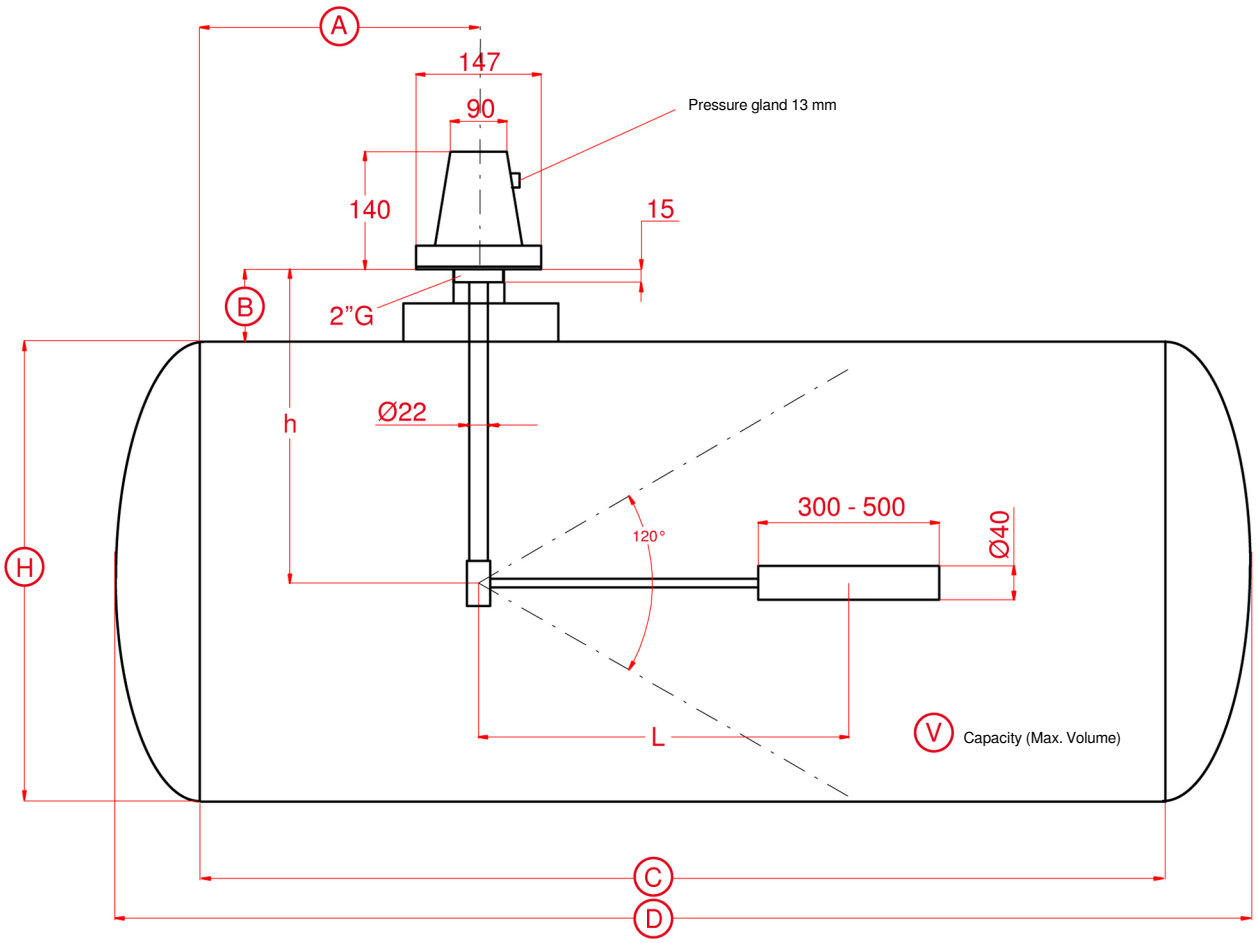
CODE NUMBERS AND REFERENCES

Code	Reference	Description
579 010	JE100	Resistive output
579 012	JE100 C	Resistive output + 1 contact (LOW level alarm)
579 639	CE-102 IP67	1 contact (LOW level alarm)
579 643	CE-103 IP67	2 contacts (LOW and HIGH level alarms)

DIMENSIONS

Dimensional (not to scale)



Dimensions A, B, C, D, H and V must be confirmed on purchase order.
In case of a rectangular shaped tank, the width must be mentioned as well.

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LIVELLO ELETTRONICO
JE 100

- Da 1250 a 3000 mm di altezza
- Trasmissione del cambio
- Montaggio su manicotto da 2 "
- Testa IP67
- 2 possibili funzioni:
  Da 1 a 2 contatti puliti
  1 uscita continua (Ω)

APPLICAZIONI

Trasmettitore di livello continuo o allarme di basso e / o alto livello in serbatoi situati all'interno o all'esterno:

Esempio di liquidi:
- Carburante
- Olio
- Acqua glicoli
- Acqua piovana

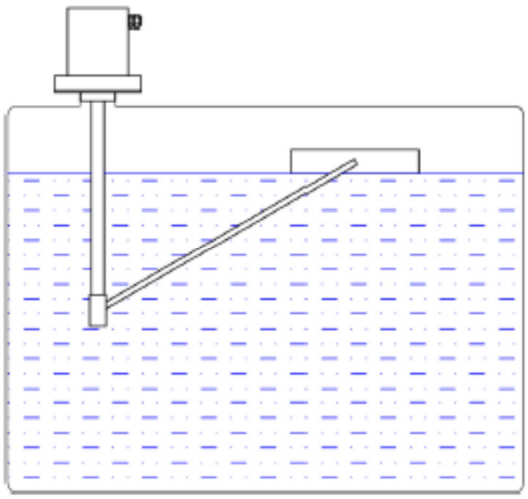
Particolarmente adatto a soddisfare le esigenze e le condizioni di utilizzo della capacità di alimentazione del combustibile di generatori collocati all'esterno.

DESCRIZIONE

Sotto la pressione del fluido, il galleggiante provoca un asse integrale di un angolo di 90 °.
Questo movimento può agire su un potenziometro che fornisce un valore di resistenza dell'immagine della misura o dei contatti per trasmettere un allarme.

L'indicatore elettrico è posizionato sulla parte superiore del serbatoio.

Il materiale viene consegnato impostato, calibrato e pronto per l'installazione.



CARATTERISTICHE TECNICHE

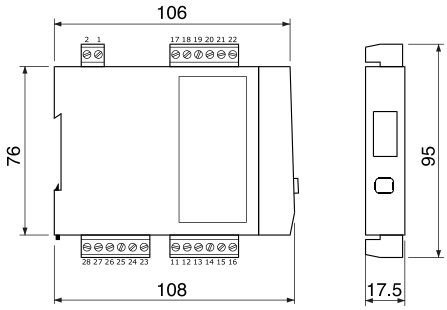
Materiali:	acciaio, nylon, Galleggiante in PVC espanso A richiesta: acciaio inossidabile 316L
Flangia :	sughero
Montaggio:	connessione GAS maschio 2 "
Calibro:	IP67 1 pressacavo da 13 mm
Pressione:	atmosferica
Temperatura:	da 0 a 40 ° C
Lunghezze:	Modello 1: da 250 a 1100 mm, Modello 2: da 1100 a 3000 mm
Graduazione	Litri
Contatto	Regolazione in fabbrica: 1 o 2 contatti di scambio, 10 A, 230 V, senza potenziale Allarme di alto livello: 90% Allarme di basso livello: 25% Altre impostazioni possibili dal 20 al 90% su richiesta.

Uscita ohmica: potenziometro
Da 0 a 215 Ω (indicativo, ± 15%)

Convertisseur universel
CUB-233

233

- **1 entrée universelle mA, V, Pt 100, potentiomètre, résistance**
- **Alimentation capteur**
- **2 sorties analogiques**
- **2 sorties relais**
- **Paramétrage par joystick ou PC**
- **Fonction linéarisation et tarage**
- **Alimentation universelle 80...256 V AC 50-60 Hz / 20...240 V DC**



APPLICATIONS

Pour toutes vos applications de conversion et isolement de signaux :
- Sondes de niveau avec sortie potentiométrique
- Sondes de niveau 2 fils, boucle 4-20 mA
- Capteurs de température Pt 100, thermocouple
- Conversion de signaux (effet loupe)
- Linéarisation spéciale (100 points)
- Alarme simple pour tous ces capteurs

DESCRIPTION

Le convertisseur universel 233 est la solution pour toutes applications de conversion et d'isolement de signaux.
Deux sorties analogiques pourront être assignées en mA ou en mV et deux sorties relais pourront être réglées sur toute l'échelle d'entrée (valeur, hystérésis et temporisation).

CARACTÉRISTIQUES TECHNIQUES

Tension d'alimentation	0...256 V AC, 50-60 Hz et 20...240 V DC sans polarité
Consommation	<4 VA
Affichage	Écran d'aide LCD graphique
Température ambiante	-10...+60 °C
Indice de protection	IP 20
Montage	Boîtier rail DIN 17.5 mm
Connexion	4 borniers débrochables
Programmation	Paramétrage par joystick ou via PC

Entrée universelle :

Courant	0-20 ou 4-20 mA
Tension	0-100 mV ou 0-10 V
Thermomètre à résistance	Pt 100 – Pt 1000, 2 ou 3 fils
Résistance 2 fils	1 kΩ – 5 kΩ – 10 kΩ – 50 kΩ
Table pour PTC et NTC	Calibre 1 kΩ – 5 kΩ – 10 kΩ – 50 kΩ, programmable avec logiciel BLOG-CUB
Thermocouple	J, K, T, B, R, S, E, NiMo, N, W3/D, W5/C, P
Potentiomètre	De 470 Ω à 100 kΩ
Alimentation capteur	Capteur 2 ou 3 fils : Max 19V et 26 mA

2 sorties analogiques et 2 relais

Courant	0-20 et/ou 4-20 mA (Impédance < 700 Ω)
Tension	0-10 V (Impédance >2 kΩ)
Relais	Inverseur – 500 mA / 250 V

Conformité CE : L'appareil satisfait aux exigences légales des Directives Européennes en vigueur.

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CODES ET RÉFÉRENCES

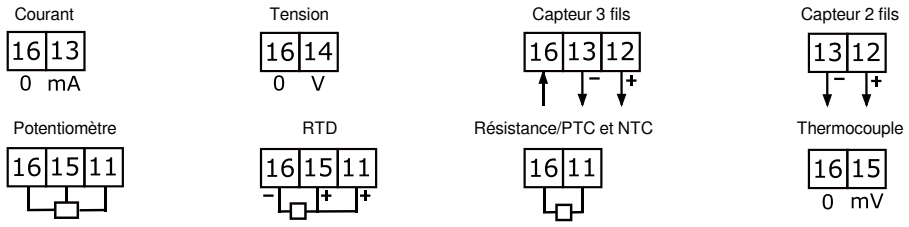
Code	Référence	Désignation
233 200	CUB-233	Convertisseur universel
233 205	CUB	Interface de communication
233 206	BLOG-CUB	Logiciel de paramétrage

FONCTIONS

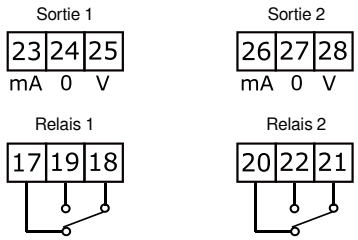
Type d'affichage	LCD vert, non rétroéclairé
Affichage	Entrée en valeur réelle et en valeur programmée Sorties en valeur programmée et pourcentage État des relais
Ajustement d'affichage	Décalage automatique de la résolution d'affichage en fonction de la valeur de la température
Facteur d'échelle en entrée	Permet un effet loupe sur l'entrée soit en manuel soit en automatique
Facteur d'échelle en sortie	Permet un effet loupe sur la sortie et sur l'affichage
Programmation	Programmation par joystick 5 positions en face avant
Mémoire Mini / Maxi	Mémorisation de la valeur maximale et minimale de la mesure
Mémorisation	Possibilité de mémorisation en sortie, de la dernière valeur mesurée en cas de rupture capteur
OffSet	Réglage de l'OffSet d'entrée sur tout type d'entrée
Tarage	Fonction tarage en entrée process
Simulation	Permet d'agir sur les sorties analogiques, relais, et sur l'affichage indépendamment de l'entrée et sans déconnecter ni l'entrée, ni les sorties
Limitation de sortie	Possibilité de limitation de la valeur de sortie Limitation haute et Limitation Basse
CSF	Compensation de soudure froide par capteur numérique 16 bits
Sécurité capteur	Traduit la rupture capteur sur l'affichage et sur les sorties relais et analogiques (en saisissant une valeur de repli)
Linéarisation en 100 points	Permet de créer une fonction de sortie par segmentation du signal d'entrée. Ex : Volume cuve cylindrique couchée / Hauteur
Linéarisation PTC - NTC résistive	Permet de créer la courbe PTC ou NTC par segmentation du signal d'entrée (programmable uniquement par le logiciel IXLOG-ULCOS via ulcos 100)
Seuils	Mode simple ou mode bande, avec sécurité positive ou négative Réglage des seuils de l'hystérésis et de la tempo (indépendante à la montée ou à la descente) Accès directs aux seuils, mémorisation et acquittement d'alarme
Acquittement des alarmes	Indépendant pour chacune des alarmes
Mémorisation des alarmes	Indépendante pour chacune des alarmes
Autres fonctions	Cut Off – Résolution 1 ou 10 points – Position de la virgule – Filtrage – Verrouillage du joystick – Réglage du contraste de l'afficheur

CÂBLAGE

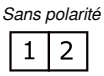
Signaux d'entrée (1 au choix)



Signaux de sortie



Alimentation



20 V DC - 240 V DC
80 V AC - 256 V AC / 50 - 60 Hz

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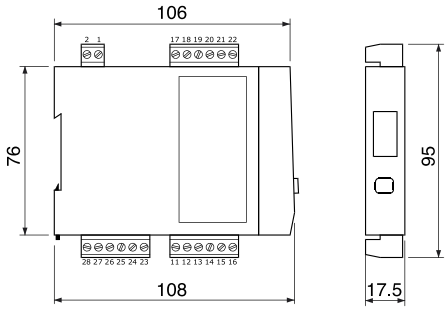
Versatil converter
CUB-233

233

- **1 Input, multi-parameters mA, V, Pt 100, potentiometric, resistor**
- **Supply to the sensor**
- **2 analogue outputs**
- **2 relay outputs**
- **Setting by joystick or PC**
- **Linearization and taring function**
- **Wide range of main supply 80 ... 256 V AC 50/60 Hz; 20 ... 240 V DC**



APPLICATIONS

For most of all use on signal conversion::
- Level measuring probe with potentiometric output
- Level measuring probe, 2-wire, 4-20 mA output
- Temperature probe with Pt 100 sensors or thermocouple
- Zooming on input signal
- Linearization along "up to" 100 points
- Alarming function for all the above sensor

DESCRIPTION

Converter 233 is a great solution for any applications to convert or monitor output signals from sensors.
Both analogue outputs may be set up as mA or mV signals and both relay outputs may be set up all along the scale (thresholds, hysteresis and delay).

TECHNICAL FEATURES

Power supply	0... 256 V AC, 50/60 Hz and 20 ... 240 V DC (no polarity)
Consumption	< 4 VA
Display	LCD screen
Ambient temperature	-10 ... +60 °C
Protection	IP 20
Mounting	Rail DIN 17.5 mm
Connections	4 removable terminal blocks
Programming	Programming through a joystick or a PC

Multi-parameters input:

Current	0...20 or 4...20 mA
Voltage	0... 100 mV or 0 ... 10 V
Resistor thermometer	Pt 100 / Pt 1000, 2-wire or 3-wire sensors
R2-wire resistor	Ranges: 1 kΩ; 5 kΩ; 10 kΩ; 50 kΩ
PTC and NTC sensors	Scales: 1 kΩ; 5 kΩ; 10 kΩ; 50 kΩ; programming with the software BLOG-CUB
Thermocouples	J, K, T, B, R, S, E, NiMo, N, W3/D, W5/C, P
Potentiometric input	From 470 Ω up to 100 kΩ
Power supply to sensor	2-wire or 3-wire sensors: Max. 19V and 26 mA

2 Analogue outputs and 2 relay outputs:

Current	0...20 and or 4...20 mA (Impedance < 700 Ω)
Voltage	0...10 V (Impedance > 2 kΩ)
Relay	Change-over 500 mA / 250 V

CE conformity: The device meets the legal requirements of the current European Directives.

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Non-contractual document: Subject to amendments due to improvements

CODE NUMBERS AND REFERENCES

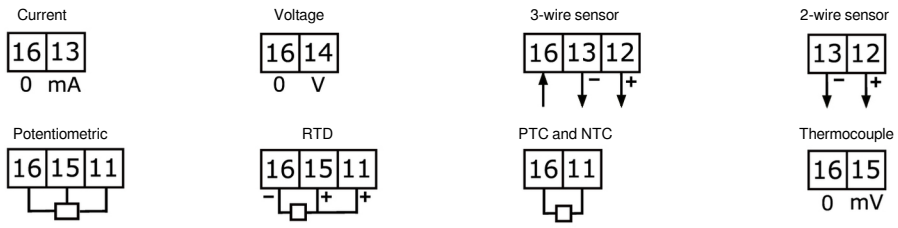
Code	Reference	Description
233 200	CUB-233	Versatil converter
233 205	CUB	Communication interface
233 206	BLOG-CUB	Programming software

FUNCTIONS

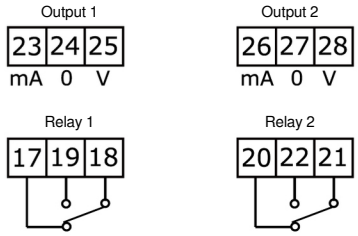
Display unit	LCD, green, non-backlit
Displayed information	Real time input value and as programmed value Outputs as set up values and percentage Relays status
Display adjustment	Lighting display adjustment according to ambient temperature
Input scale factor	Allows a zoom effect on input signal or manual or automatically.
Output scale factor	Allows a zoom effect on input signal and displayed value.
Programming	Programming through a joystick in front, 5 positions
Memory, Min. / Max.	Logging of Min. and Max. measurements
Saved value	Possibility to store at the output, the last measured value in case of sensor failure
Offset	Offset set up on input for any signal type
Taring function	Taring funtionon signal inputs
Simulation	Simulation programme actuates on analogue outputs, relays and display indedently of input value and without disconnecting the sensors neither output connections.
Output signal restrictions	Possibility of limiting the output value High and low limits to set up
Reference junction	The reference junction is insured through a numerical sensor 16 bits
Input safety signal	In case of broken loop input signal, CUB 233 produces a set up value on display and outputs.
Linearization with 100 points	Allows an output signal from a segmented input signal. e.g.: Volume of a cylindrical and horizontal tank vs. height of fluid
Linearization PTC - NTC resistors	Allows to correct the PTC or NTC signal against segmented input signal. (programming only with the software BLOG CUB)
Thresholds	Simple mode or bandwith mode, with positive or negative safety Set up of hysteresis and delay, independently for decreasing or increasing signals. Direct access to thresholds, memory and alarm reset
Alarm reset	Independently on each alarm
Alarm saving	Independently for each alarm
Other functions	Cut Off - 1 or 10 points resolution - Comma position - Filtering - Joystick lock - Contrast adjustment of display screen

ELECTRIC CONNECTIONS

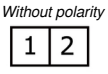
Input signals (1 to choose)



Output signals



Power supply



20 ... 240 V DC

80 ... 256 V AC - 50/60 Hz

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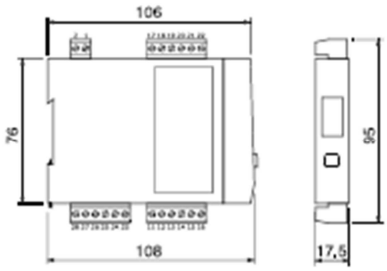
CONVERTITORE UNIVERSALE
CUB 233



1 entrata universale
mA, V, Pt 100, potenziometro, resistenza
• Alimentazione del sensore
• 2 uscite analogiche
• 2 uscite a relè
• Impostazione tramite joystick o PC
• Funzione di linearizzazione e calibrazione
• Potere universale
80 ... 256 V AC 50-60 Hz / 20 ... 240 V DC

APPLICAZIONI

Per tutte le tue applicazioni di conversione e isolamento del segnale:
- Sonde di livello con uscita potenziometrica
- Sonde di livello a 2 fili, loop 4-20 mA
- Sensori di temperatura Pt 100, termocoppia
- Conversione del segnale (effetto ingranditore)
- Linearizzazione speciale (100 punti)
- Semplice allarme per tutti questi sensori

DESCRIZIONE

Il convertitore universale 233 è la soluzione per tutte le applicazioni di conversione e isolamento dei segnali.
È possibile assegnare due uscite analogiche in mA o mV e due uscite relè possono essere impostate sull'intera scala di ingresso (valore, isteresi e tempo di ritardo).

CARATTERISTICHE TECNICHE

Tensione di alimentazione	0 ... 256 V CA, 50-60 Hz e 20 ... 240 V DC senza polarità
Consumo	<4 VA
Visualizza	Schermata di aiuto dell'LCD grafico
Temperatura ambiente	-10 ... + 60 ° C
Classe di protezione	IP 20
Montaggio	su guida DIN 17,5 mm
Connessione	4 morsettiere rimovibili
Programmazione	tramite joystick o PC

Ingresso universale:

Corrente	0-20 o 4-20 mA
Tensione	0-100 mV o 0-10 V
Termometro a resistenza	Pt 100 - Pt 1000, 2 o 3 fili
Resistenza a 2 fili	1 kΩ - 5 kΩ - 10 kΩ - 50 kΩ
Tabella per PTC e NTC	1 kΩ - 5 kΩ - 10 kΩ - 50 kΩ programmabile con il software BLOG-CUB
Termocoppia	J, K, T, B, R, S, E, NiMo, N, W3 / D, W5 / C, P
Potenziometro	Da 470 Ω a 100 kΩ
Alimentazione sensore	Sensore a 2 o 3 fili: massimo 19V e 26 mA

2 uscite analogiche e 2 relè

Corrente	0-20 e / o 4-20 mA (Impedenza <700 Ω)
Tensione	0-10 V (impedenza> 2kΩ)
Relè inverter	500 mA / 250 V

Proprietà

DATA 4 ITALY

Progetto

DC 07
MILAN

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Assistente del committente	**GARRETTI ASSOCIATI S.r.l.** via Trieste, 9 - 20146 MILANO www.garrettiassociati.it	Tél. : +39 02 430 6931 Fax : +39 02 480 170 51
Progetto architettonico	**GARRETTI ASSOCIATI S.r.l.** via Trieste, 9 - 20146 MILANO www.garrettiassociati.it	Tél. : +39 02 430 6931 Fax : +39 02 480 170 51
Opere edili e prefabbricati	**GENERALE PREFABBRICATI S.p.a** centro direzionale quattrotorri 06132 PERUGIA www.generaleprefabbricatispa.com	Tél. : +39 075 517 29 83 Fax : +39 075 518 12 88
Impianti meccanici	**OMEGA CONCEPT IMPIANTI E SISTEMI S.p.a.** Via Chiese, 72 - 20126 - MILANO www.engie-axima.fr	Tél. : +39 02 8180951 Fax : +39 02 8135163
impianti elettrici/dati	**ENGIE CONTRACTING ITALIA S.r.l.** Via Chiese, 72 - 20126 - MILANO www.engie.com	Tél. : +39 02 94399262 Fax : +39 02 94399655
	SCHNEIDER ELECTRIC S.p.A. Via Circonvallazione Est, 1 - 24040 STEZZANO (BG) www.schneider-electric.com	Tél. : +39 0354151111 Fax : +39 0354153200
	ENERIA Rue de Longpont - BP 10202 - 91311 MONTLHERY Cedex - FRANCE www.eneria.fr	Tél. : +33 (0) 169802100 Fax : +33 (0) 169802150
Progettazione antincendio	**STUDIO TECNICO ZACCARELLI S.r.l.** via Ludovico il Moro, 17 - 20143 MILANO www.studiozaccarelli.it	Tél. : +39 02 891 200 81 Fax : +39 02 813 962 8
Supervisione	**ITALSOCOTEC S.p.a.** Via Pontaccio,12/A- 20121 Milano italsocotec@italsocotec.it	Tél. : +39 02 89051500 Fax : +39 02 89051501

Cod	Data	Descrizione
	31/01/2023	DOE

DATA 4 ITALY - DC07
Declaration jauge / Gauge Declaration
Dichiarazione Indicatore serbatoio

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DECLARATION DE CONFORMITE CE
EC DECLARATION OF CONFORMITY
EG-KONFORMITÄTSERKLÄRUNG
DECLARACIÓN DE CONFORMIDAD CE
DECLARAÇÃO DE CONFORMIDADE CE

Nom du Fabriquant/Manufacturer's name/Name des Herstellers/Nombre del fabricante/Nome do fabricante

INTERJAUGES Sarl
Siret : RC 322 033 184

Adresse/Address/Anschrift/Dirección/Endereço

24 Route de Chatillon
28290 Commune nouvelle d'Arrou
FRANCE

Déclare sous sa seule responsabilité en qualité de fabriquant que le produit :
Declares under its sole responsibility as a manufacturer that the product:
Erklärt unter seiner alleinigen Verantwortung als Hersteller, dass das Produkt:
Declara bajo su exclusiva responsabilidad como fabricante que el producto:
Declara sob sua exclusiva responsabilidade como fabricante que o produto:

Série JE 100

Est conforme aux directives suivantes/is in accordance with/mit den folgenden Richtlinien übereinstimmt/Cumple con las siguientes directrices/Cumpre as diretrizes seguinte

- **2014/35/EU (LVD)**
- **2014/30/EU (EMC)**
- **2011/65/EU (RoHs)**

Pour évaluer la conformité, les normes suivantes ont été consultées :
To assess conformity the following standards were consulted:
Zur Beurteilung der Konformität wurden die folgenden Normen herangezogen:
Para evaluar la conformidad se consultaron las siguientes normas:
Para avaliar a conformidade os seguintes padrões foram consultados:

- **EN 61010 (LVD)**
- **EN 61326 (EMC)**

Arrou le 01/12/2018

Yannick Moinet
Gérant Interjauges Sarl

iNTERJAUGES
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- **2014/30/EU (EMC)**
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